C
G296vZac
1872/74-
1921/22
incompl.

Digitized by the Internet Archive
in 2012 with funding from
University of Illinois Urbana-Champaign

http://archive.org/details/annualreportofpr7222univ

C
.96GZaC
1874

FIRST REPORT

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

OF THE

Georgia State College

Of Agriculture & the Mechanic Arts.

ATHENS, GEORGIA.

1874.

Compliments of
W. L. BROUN, *President.*

GEORGIA STATE COLLEGE

Of Agriculture & the Mechanic Arts.

A DEPARTMENT OF THE

UNIVERSITY OF GEORGIA,

1874.

ATHENS, GEORGIA.

PUBLISHED BY AUTHORITY.

ATHENS, GA.
SOUTHERN WATCHMAN NONPAREIL JOBBER PRINT.
1874.

[illegible]
1921/22
incompl.

REPORT

OF THE

GEORGIA STATE COLLEGE

Of Agriculture & the Mechanic Arts.

ACTS OF THE LEGISLATURE OF GEORGIA,

ACCEPTING THE DONATION OF LANDS BY THE CONGRESS OF THE UNITED STATES, AND PROVIDING FOR A COLLEGE OF AGRICULTURE AND THE MECHANIC ARTS.

An Act accepting for the State of Georgia the donation by the United States of certain lands to the several States and Territories which may provide Colleges for the benefit of Agriculture and the Mechanic Arts, by Acts of Congress, approved severally, July 2d, 1862, *and April* 14*th*, 1864, *and for other purpoees therewith connected.*

Section 1. The General Assembly of the State of Georgia do enact, That the State of Georgia hereby accepts the donation by the United States, of such public lands as may be apportioned to said State, under an Act of the Congress of the United States, entitled an Act donating public lands to the several States and Territories which may provide Colleges for the benefit of Agriculture and the Mechanic Arts, approved July 2d, 1862, and an Act extending the time within which the States and Territories may accept the grant of lands made by the aforesaid Act, approved April 14th, 1864, upon the terms and conditions prescribed therein.

Approved 10th March, 1866.

An Act to provide a College for the benefit of Agriculture and the Mechanic Arts in the State of Georgia, under Acts of Congress, appeoved respectively 2d *July*, 1862, *and* 14*th April*, 1864.

SECTION 1. Be it enacted, &c., That his Excellency, the Governor of this State, be, and he is hereby authorized and requested, in such manner as he may deem best, to apply for, receive and sell the lands and land-scrip to which the State of Georgia is entitled, under an Act of Congress entitled "An Act donating public lands to the several States and Territories which may provide Colleges for the benefit of Agriculture and the Mechanic Arts," approved 2d July, 1862, by virtue of an acceptance thereof, as signified by an Act of this State, approved 10th March, 1866; to invest in like manner, as he may deem best, the proceeds of said sale or sales, in the bonds of this State, and disburse the interest of said investment for the support and maintenance of a College such as contemplated by said Act of Congress; to provide rules and regulations for the organization, goverance and operation of said College until the next ensuing session of the General Assembly of this State; and to do and perform all other such acts as may be necessary and proper to secure to the State of Georgia the full benefits contemplated by said Act of Congress, so far as the same may be found practicable.

SEC. 2. That to carry into effect the provisions of this Act there be, and is hereby appropriated, the sum of two thousand ($2,000.00) dollars, payable on the warrant of his Excellency the Governor; and that this Act be in force from and immediately after its passage.

Approved 12th December, 1866.

ORDER OF HIS EXCELLENCY THE GOVERNOR,

In reference to the College of Agriculture & the Mechanic Arts.

EXECUTIVE DEPARTMENT,
ATLANTA, GA., March 30, 1872.

WHEREAS, by the Act of Congress, approved July 2, 1862, entitled "An Act donating lands to the several States and Territories which may provide Colleges for the benefit of Agriculture and the Mechanic Arts," there was granted to the several States an amount of public land, equal in quantity to thirty thousand acres for each Senator and Representative to which said States were entitled by the apportionment under the census of 1860;

And, whereas, by a legislative Act, approved March 10, 1866, this State accepted the grant agreeably to the conditions therein specified, thereby undertaking that the donation made and accepted as aforesaid, should be kept, used and applied as prescribed in the said Act of Congress;

And, whereas, on the third day of January, 1872, the Hon. BENJAMIN CONLEY, exercising the executive powers of the government, sold the land scrip previously issued to this State under said Act of Congress, to one Gleason F. Lewis, for the sum of two hundred and forty-three thousand dollars, a part of which, to-wit: fifty thousand dollars, has been paid, and the remainder of which is to be paid within eighteen months from and after the day of sale;

And, whereas, the time allowed the States accepting said donation, to establish a College or Colleges, under the provisions of said Act of Congress, will expire on the second day of July, 1872, when, by the terms of said grant, if a College, such as is therein described, shall not have been established, the grant will cease and this State will be bound to repay to the United States the proceeds of the donation aforesaid;

And, whereas, by a legislative Act of this State, approved December 12, 1866, entitled "An Act to provide a College for the benefit of Agriculture and the Mechanic Arts in the State of Georgia, under Acts of Congress approved, respectively, July 2, 1862, and April 14, 1864," the Governor is authorized to receive and sell the land and scrip to which the State was entitled under the Act of Congress approved July 2, 1862, and to invest the proceeds of such sale, as he may deem best, in bonds of this State, and disburse the interest of said investment for the support and maintenance of a College such as is contemplated by said Act of Congress, and to provide rules and regulations for the organization, goverance and operation of said College until the next ensuing session of the General Assembly of this State, and to do and perform all other such acts as may be necessary and proper to secure to the State of Georgia the full benefits contemplated by said Act of Congress, so far as the same may be found practicable;

And, whereas, the University of Georgia is the only institution of learning in this State having the power by law, to organize and establish a College in all respects such as is described in said Act of Congress, and the Board of Trustees of said University having established a College, distinct in its organization and specific as to its objects, in conformity, in every respect, with the Acts of Congress above named, as follows, that is to say:

I.—Title.

The name of this College shall be "THE GEORGIA STATE COLLEGE OF AGRICULTURE AND THE MECHANIC ARTS."

II.—Government.

The administrative details of this College, such as concern its discipline and schedules of study, shall be entrusted to the Chancellor of the University of Georgia, and to its corps of officers as hereinafter named, agreeably to such general provisions as the Board of Trustees of the University shall ordain for their control, as its agents in the fulfilment of this trust.

III.—Officers.

The officers of this College shall be as follows:

1st. A President, who shall be charged with the special oversight of the College, under the direction of the Chancellor.

2d. A Professor of Agriculture and Horticulture, who, besides performing the usual duties of his chair, shall deliver each year, in different parts of the State, such popular lectures on Agriculture and Horticulture as may be found practicable.

3d. A Professor of Analytic and Agricultural Chemistry.

4th. A Professor of Mineralogy and Economic Geology.

5th. A Professor of Natural History and Physiology.

6th. A Professor of Industrial Mechanics and Drawing.

7th. A Professor of Physical Geography and Meteorology, with the assigned duty, in addition to his work of instruction, of making, as far as possible, a physical survey of the State, with reference to the development of its natural resources.

8th. A Professor of English Language, who shall give special attention to the training of the students in those branches that constitute an English scholar.

9th. A Professor of Military Tactics.

IV.—Engineer Department.

The Civil Engineer School, now a part of the University of Georgia, and under the control of Prof. CHARBONNIER, is hereby transferred to the College of Agriculture and the Mechanic Arts; the Professor to be a member of the Faculty of Instruction in said College, and to perform the duties of Professor of Military Tactics.

V.—Free Tuition.

Free Tuition in this College is hereby guaranteed to as many students, residents of the State, as there are members of the General Assembly of Georgia; and in addition to this free tuition in the College, all such students are likewise entitled to the advantages of the different Departments of the University of Georgia, without charge.

VI.—Co-operation of the University.

The Chancellor is hereby instructed, with the other officers of the existing organization of the University, to render such services to the College as may be possible, without conflict with their present duties, and to sustain, as far as practicable, its schedule of studies, under a provisional arrangement, until the organization of its Faculty of Instruction shall have been completed.

VII.—Rules and Regulations.

The Rules and Regulations of the Board of Trustees, as applicable to the University, are hereby extended to the College, except as otherwise ordered in this act of organization.

VIII.—Opening.

The Chancellor is hereby instructed to open this College by May 1st, 1872, in the University High School, and such other University buildings as may be necessary; and to make such arrangements, if possible, as shall secure boarding for the students at a sum not exceeding $125, for the College year.

C. J. JENKINS, *Pres't.*

Countersigned,

W. L. MITCHELL, *Sec'y.*

And it appearing to me that the College organized by the Board of Trustees of the University of Georgia, as hereinbefore set forth, is in conformity with the provisions of said Act of Congress; it is therefore

Ordered, That the two hundred and forty-three thousand dollars, derived from the sale of the land scrip as aforesaid, as the same is paid, shall be invested in bonds of the State of Georgia, issued under the Act of the Legislature of this State, approved the 18th day of January, 1872, bearing seven per cent. interest; and that the money so invested shall constitute a perpetual fund, the capital of which shall remain forever undiminished, (except as hereinafter excepted,) and the interest of which shall be inviolably appropriated to the endowment, support and maintenance of the College organized by the Board of Trustees of the University of Georgia, as hereinbefore set forth. That the leading object in said College shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to Agriculture and the Mechanic Arts, in such manner as the Legislature of this State may prescribe. The annual interest accruing upon said bonds shall be regularly applied, without diminution, to the purposes hereinbefore set forth. An amount, not exceeding ten per centum upon the sum of two hundred and forty-three thousand dollars, may be expended for the purchase of lands for sites or experimental farms, when authorized by the Legislature of this State, and not otherwise. No portion of said fund nor the interest thereof, shall be applied, directly or indirectly, under any pretence whatever to the purchase, erection, preservation or repair of any building or buildings. An annual report shall be made, under the direction of the Board of Trustees of the University to the Governor of the State, who shall lay the same before the General Assembly at its next session, recording any improvements and experiments made, and the cost rnd results and such other matters including State industrial and economical statistics as may be supposed useful. The said Board of Trustees shall also cause one copy of said report to be transmitted, by mail, free, to each of the other Colleges endowed under the provisions of the Act of Congress aforesaid, and also one copy to the Secretary of the Interior.

It is further Ordered, That the bonds in which said fund shall be invested as aforesaid, shall be turned over to the Board of Trustees of the University of Georgia; that upon receiving said bonds, or any of them, the said Board of Trustees shall cause each of the same to be impressed with the seal of said University; and that, upon no pretence whatever, shall said bonds or any part thereof, be disposed of by said Board of Trustees.

In testimony whereof, I have hereunto set my hand, and caused the seal of the Executive Department to be affixed, the day and year above written.

JAMES M. SMITH.

By the Governor,
J. W. WARREN, *Sec'y Ex. Dep't.*

BASIS OF AN AGREEMENT BETWEEN THE UNIVERSITY OF GEORGIA AND THE NORTH GEORGIA AGRICULTURAL COLLEGE AT DAHLONEGA, ENTERED INTO OCTOBER 24TH, 1872.

The North Georgia Agricultural College conveys to the Trustees of the University of Georgia, the use and control of the buildings and real estate for such length of time as the Trus-tees of the University of Georgia shall continue to perform he part of these stipulations.

The University of Georgia shall pay annually two thousan dollars* from the interest of the Agricultural Fund donated b Congress, so long as the same remains intact in the hands o the Trustees of the University of Georgia, to pay one or more teachers in the institution—the Principal to be elected by the Trustees ot the University of Georgia.

---

*This sum was increased subsequently by the Trustees of the University t $2,500 per year, and thirty free scholarships in the State College were grant-ed to that institution.

The control of details and the management of the institution, and the appointment of subordinate teachers, shall be in the hands of the Local Board, subject at all times, to the revision and control of the Trustees of the University, in whom is the ultimate power of legislation.

This agreement is on condition that, after the year 1875 one hundred male students be kept at the institution in Dahlonega, a proportionate sum to be paid for a less number, but to cease when the average number for one year shall be reduced below fifty. The expenses of repairs of buildings, furnishing warming, &c., and the pay of teachers beyond two thousand dollars, shall be raised by the Local Board, and the Trustees of the University shall not be liable for any debt of said College beyond the two thousand dollars hereby pledged. Nothing herein contained shall prevent the North Georgia Agricultural College from deriving the full benefit from any appropriation hereafter made by Congress for establishing a school of mines in connection with said institution, or any other appropriation given for its benefit by Congress.

BENJ. C. YANCEY, *Ch'm. Com.*
W. P. PRICE,
Ch'm. on the part N. G. College.

An Act to equitably adjust the claims of the colored race for a portion of the proceeds of the Agricultural Land Scrip.

SECTION 1. Be it enacted, etc., That the sum of eight thousand dollars be, and the same is hereby annually appropriated to the Atlanta University,* upon condition that said institution shall admit, for instruction in the same, as many colored pupils, from each county in the State, free of charge for tuition, as there are or may be members of the House of Representatives of this State from such county, to be nominated by said members respectively, so long as said appropriation continues: *Provided*, The Governor shall not draw his warrant for the said sum until the trustees of said institution shall have submitted a plan, for the expenditure of said sum, to a board of commissioners, consisting of the Chancellor of the State University, and two members of the Faculty of the same, to be selected by him; and until such plan, upon such modification as may be required by said commissioners, shall be approved by them, or a majority of them, each year, in writing, and filed in the Executive office; and said commissioners shall, at all times, have authority to exercise all power necessary to see that said fund is faithfully applied, according to said plan of expenditure.

---

*This sum was paid the Atlanta University in 1872–'73.

SEC. 2. That the appropriation herein provided for shall be in lieu of any claim of the colored population of this State upon the proceeds of the Agricultural Land Scrip donated by the Congress of the United States; and the course of instruction in said institution shall be so far modified as may be necessary to adapt the same to the objects of said grant.

SEC. 3. That the Board of Visitors of the State University, or a committee of their body, shall exercise like functions and powers touching said institution as are prescribed by law, for said board, in relation to the State University.

SEC. 4. That nothing contained in this Act shall operate to impair the right of the State to make a readjustment of said fund between the two races, should Congress hereafter make an additional grant or grants to the State for educational purposes.

SEC. 5. Repeals conflicting laws.

Approved March 3, 1874.

REPORT OF THE PRESIDENT.

The GEORGIA STATE COLLEGE OF AGRICULTURE & THE MECHANIC ARTS was organized provisionally, March 30th, 1872. In one month thereafter, the College was opened and students were admitted. During the provisional organization, ninety-six students were received. The permanent organization, as a department of the University of Georgia, was effected August 7th, 1872.

There were admitted during the session 1872–'73, one hundred and fifty-one students. Of these, one hundred and forty were received without charge for tuition. During the present session, there have been admitted one hundred and thirty-one students, and of these one hundred and twenty-eight have been received tuition free.

As a general rule, the students have been remarkably earnest in their efforts to acquire knowledge, and in some departments have attained the highest grade in scholarship. When students of this College are fully prepared for the Junior or Senior Classes, they attend in the same class the same Professor as the other students of the University, in all subjects that are alike required of them for degrees. This intimate union of absolute equality has proved mutually beneficial.

During the first and second years all the students are required to attend the Professor of Agriculture and the Instructor in Geometrical Drawing in addition to the other necessary studies in English and Mathematics. When they are prepared to enter the Junior Class they have the privilege of electing the course of study.

The studies of this College, as now organized, embrace Mathematics, English and English Literature, History, Drawing, Book-keeping, Mechanics, Physics, Astronomy, Meteorology, General Chemistry, Industrial Chemistry, Analytical and Agricultural Chemistry, Mineralogy and Geology, French and German, Agriculture, Civil and Mechanical Engineering, with Military Tactics.

These subjects are so co-ordinated as to present three separate courses of education. I.—Course in Agriculture. II.—Course in Applied Chemistry. III.—Course in Engineering.

Military Tactics is taught by the Professor of this department, and all the students in this College, unless physically disabled, are required to take part in the regular drills. A prescribed uniform is ordered to be worn.

Free tuition is offered in this College to as many students—residents of the State—as there are members of the House of Representatives and Senators in the General Assembly.

A Commercial Department has been organized, by authority of the Faculty, and Penmanship and Book-keeping are systematically taught by a teacher of large and successful experience in giving instruction on these special subjects. Excellent opportunities are offered to students who may desire to prosecute those subjects of study embraced in a Commercial Course.

Seven Professors, some of whom are also engaged in the other departments of the University, and three Instructors, are employed in the regular duties of instruction. It is expected that other Professors in special Scientific subjects, will be added at an early day.

The following classification of the students with respect to the studies they are engaged in, exhibits the number at present prosecuting each subject the present session, and also for the session '72–'73.

English, including Rhetoric..	Session	'73,	120.	Session	'74,	89
History..................	“	“	71.	“	“	87
French....	“	“	55.	“	“	30
German..................	“	“	1.	“	“	0
Penmanship & Book-keep'g..	“	“	...	“	“	16
Geometrical Drawing.......	“	“	142.	“	“	122
Mathematics...............	“	“	149.	“	“	130
Physics..................	“	“	35.	“	“	31
Mechanics...............	“	“	41.	“	“	42
Astronomy................	“	“	29.	“	“	30
General Chemistry.........	“	“	26.	“	“	34
Industrial Chemistry.......	“	“	10.	“	“	11
Analytical Chemistry.......	“	“	7.	“	“	6
Agricultural Chemistry.....	“	“	10.	“	“	11
Mineralogy and Geology....	“	“	10.	“	“	11
Agriculture...............	“	“	106.	“	“	98
Engineering...............	“	“	35.	“	“	30
Military Tactics...........	“	“	...	“	“	125

The city of Athens has generously contributed $25,000 in bonds, to be used for the purpose of building a Laboratory for this College, and $3,000 have been subscribed to assist in purchasing apparatus. This building will be completed this year. When finished, to equip it thoroughly, as we hope to do, for a Chemical and Physical Laboratory, with modern apparatus needed for instruction and for investigation, will require not less than $30,000.

An appeal will be made to the friends of science to secure this amount by subscription. To each person who subscribes $100 to this apparatus fund, there will be issued, by authority of the Trustees, a bond with two tuition coupons attached. Each coupon will be receivable for all charges of tuition in this College for one year. It is confidently expected that this Hall thus equipped, will prove a valuable auxiliary in advancing the cause of science-education in our State and in the South-West.

In the department of Chemistry, in the time that could be spared from the duties of instruction, some work has been done in investigating the Chemistry of the Cotton Plant, and in analyzing and comparing the commercial values of fertilizers. It is designed to continue the investigation of these subjects, and it is anticipated that by careful chemical analysis of the cotton plant grown on different soils, results of value to our whole State will be reached.

Some of the fertilizers sold in this State have been analyzed, and their comparative commercial values calculated, for the purpose of aiding the interests of agriculture. These fertilizers have all been analyzed by the same method; and in estimating their values, the phosphates of iron and alumina are not considered; these combinations of phosphoric acid being regarded of no agricultural value. The "*reduced*" phosphoric acid has been estimated of equal value with that soluble in pure water. It is probable this is too liberal an estimate, and that a fair valuation will be less; inasmuch as the per centage of this form depends more on time than on original cost of manufacture. Examinations now undertaken will decide this question by next year.

Rust in Cotton and the Cotton Caterpillar, as well as other diseases of plants and injurious insects, will be made the subject of special study and scientific examination in this College so soon as the Faculty is increased by a Professor of Natural History, to whom these subjects will be assigned.

The Professor of Agriculture has carefully conducted a number of valuable experiments on the few acres of land appropriated for that purpose. These will be continued under varied conditions. Next year very careful experiments will be undertaken to determine the increased solubility of ground bone phosphate, by composting it with stable manure and with cotton seed. These experiments will tend to the solution of a question of great economic interest to the entire South. It being this: Will bone phosphate, ground sufficiently fine, be so decomposed and rendered soluble in the waters of the soil by the action of stable manure and cotton seed, or by either, as to answer all the purposes of Southern agriculture?

Object of the College.—The "*leading object*" of this College is, as defined by the Act of Congress, "to teach such branches of learning as are related to Agriculture and the Mechanic Arts......in order to promote the liberal and practical education of the industrial classes." The course of education therefore, here prescribed, is not to teach Agriculture as an art, but in accordance with the law, it includes "*such branches of learning as are related to Agriculture.*"

The Courses offered are adapted to both a "liberal and practical education"—that is, a practical education based on a liberal education. It is no part of the system to make empirics. The practical education given, is the practical application of the Sciences whose principles have been previously studied. The students will have these practical applications in the Laboratories and at the Experimental Farm.

The resources are now too limited to fully develop this department of Industrial Education. Its expansion here, as elsewhere, must be gradual, in proportion as means are available.

It is designed, when the resources will permit, to provide commodious Laboratories and thoroughly equip them with Modern Apparatus; to provide a larger Experimental Farm and furnish it with improved agricultural implements; to establish a Plant-house for illustrations in Botany; to place in the Industrial Museum models of implements and machines, products of Agriculture, of Manufacture and the Mechanic Arts generally; and to provide for the students a Reading-room with Reviews, Magazines and the prominent agricultural journals.

Attention is invited to the Reports of the Professors in the Departments of Agriculture, Applied Chemistry and Engineering.

W. LEROY BROUN, President.

Athens, Ga., March 5th, 1874.

DEPARTMENT OF AGRICULTURE.

REPORT OF E. M. PENDLETON,

PROFESSOR OF AGRICULTURE.

The Trustees of the University of Georgia, having appropriated a small field of ten and a half acres for agricultural experiments under my direction, I beg leave to make my report of results for the year 1873.

The soil on this experimental station is thin, having been in cultivation a number of years. It originated in the disintegration of a micaceous slate which underlies it, and crops out extensively in the neighborhood.

We did not experiment with commercial fertilizers, as we have learned by experience that they do not generally possess uniformity. They may be one thing one year, and another thing another year, according to the grade of the material purchased in the markets.

The ammoniated super-phosphate used, contained about three per cent. of ammonia, actual and potential, and about eighteen per cent. of soluble phosphate of lime, with small additions of chlorine, soda and potash.

The fertilizers were generally tested in rows seventy yards long, with three parallel rows on each side of each plat, without any manure; the middle row being counted for the natural production of the soil.

Where estimates are made as to per cent. on investment, the cotton is rated at thirteen cents per pound, saying nothing of the value of the increased production of the seed.

We experimented mostly on cotton, not only because it constitutes the great staple of the South, but because experiments can be made with much more ease and precision, on cotton, than any other farm product. The season was too far advanced for experiments on small grain crops.

Of the elements of the cotton plant, only two are estimated of high value by Agricultural Chemists, viz: Nitrogen and Phosphoric Acid; the first organic, and a constituent of the atmosphere, the other a mineral, and a constituent of the soil. Our commercial fertilizers produce all, or nearly all their effects by these two agencies. It is well known that Peruvian Guano will double, and sometimes treble the production of cotton and wheat, and grass too. This is done simply by having these principles in soluble proportions. Both of these must be in certain forms. Nitrogen must be in the form of ammonia or nitric acid, which are soluble; and phosphoric acid must be in a soluble form also. Making it mechanically fine, does not render it soluble in cold water, because it is still in the tri-calcic form and insoluble. The finer it is ground, however, the more readily it becomes soluble—not in cold water, but by the action of sulphate of ammonia, chloride of sodium and carbonic acid in the soil. There is a surplus of phosphoric acid in all of the worn soils of Georgia, but it is in the tri-calcic form. Plants cannot take it up. Cold water cannot dissolve it, and it will lie there through all time, unappropriated, till it meets with a solvent, changing its form from an insoluble phosphate to a soluble bi-phosphate of lime, or a phosphate of ammonia. Potash, magnesia, silica, etc., are not only more abundant In soils than phosphoric acids, and generally less appropriated by plants, but exist in better forms for appropriation. This is the great reason why phosphoric acid is so important as a fertilizer.

EXPERIMENTS.

1. *As to the amount of ammonia necessary to be applied in proper combinations for one acre of cotton:* 200 lbs. of Peruvian guano, containing 20 lbs. of ammonia, was applied per acre, or at that rate, and produced 828 lbs. of seed cotton. The soil without manure, made 540 lbs. A combination of superphosphate of lime, animal matter, alkaline salts and Peruvian guano, at the rate of 200 lbs. per acre, at less cost, made 922 lbs. This mixture contained only 5½ lbs. of ammonia, showing that more than this is unnecessary and that there was a waste of 15 lbs. of ammonia in applying the guano by itself.

2. By way of testing *the requisite amount of superphosphate.* I applied in three rows, three different formulas; each of them

100 lbs. of animal matter. To No. 1, I put 16½ lbs. of soluble phosphate of lime; to No. 2, 33 lbs., and to No. 3, 66 lbs. The first produced 753 lbs. of seed cotton; the second 772; the third 787 lbs., and the natural soil 386 lbs. Thus showing that on this soil, with an equal amount of nitrogen, 66 lbs. to the acre is better than a less quantity, as to production.

3. To prove that phosphoric acid is the first mineral principle exhausted from worn soils, and the first needed as a fertilizer, we applied a compound containing 50 lbs. each of mur. potash, sulphate of magnesia, sulphate of lime and chloride of sodium, embracing all the mineral elements in soluble forms except phosphoric acid. It produced 158 lbs. of seed cotton more than the natural soil, at an actual loss of $1.12 to the acre. The soluble phosphoric acid without any of these substances except the necessary associate of lime, made 187 lbs. more than the natural soil, and paid a net profit per acre of $12.10.

4. We tested the value of a number of salts sold to farmers to make home compounds, with the following results: 200 lbs. of nitrate of soda made a clear loss of $8.25 per acre. The same amount of German potash, $6.20; nitrate of potash $30.20; chloride of sodium (common salt) about paid for itself. The only two articles which paid a profit was sulphate of lime, (land plaster) and sulphate of soda (nitre cake.) The sulphate of ammonia, a valuable salt in proper combinations, made a clear loss of $7.85 per acre. Whatever value then attached to these salts, is found in their combinations, or their chemical action on the substances with which they are composted.

5. We treated ashes with sulphuric acid with a view to convert all tne salts into soluble sulphates; 200 lbs. per acre produced 802 lbs. seed cotton. The same amount of wood ashes produced 675 lbs. against 607 lbs. for the natural soil.

6. What effect will an undue quantity of lime have upon superphosphates? On a poor soil we applied at the rate of 100 lbs. of superphosphate to the acre, making 737 lbs. of seed cotton. The rows by the side, with an equal quantity of air-slaked lime, made 525 lbs. In another experiment, we mixed the lime, partially air-slaked, with the superphosphate, and added water, which produced some heat resulting in a hard cemented mass. This we dried and pulverized, and it produc-

ed at the rate of 750 lbs. to the acre. It contained 200 lbs. of lime and the same of superphosphate; 200 lbs. of superphosphate alone produced 887 lbs. The same amount of lime alone, produced 675 lbs., and the natural soil 600 lbs. per acre.

7. Of the three forms in which nitrogen is applied, which is the most efficient as a fertilizer? Nearly all the chemists, from their small experiments in flower pots, have decided in favor of nitric acid in the nitrates. My conclusions are that ammonia and organic nitrogen in the form of albuminoids, as dried flesh, etc., are much more active and efficient than the nitrates. In one experiment bearing directly on this point, 200 lbs. of nitrate of soda, containing 90½ lbs. of nitrogen, made 75 lbs. of seed cotton over the natural soil. 200 lbs. of nitrate of potash (saltpetre) containing 75½ lbs. of nitrogen, made 34 lbs. overplus. 200 lbs. of sulphate of ammonia containing 36 lbs. of nitrogen, made 222 lbs; and 24 lbs. of nitrogen as an albuminoid made 361 lbs.

ESTIMATING VALUES.

Nitrogen as a nitrate, will not act near so well in the production of cotton, as it will as ammonia; hence it is not worth as much to the farmer. Nitrogen, as ammonia, will not produce one-fourth as much by itself as it will in combination with soluble phosphoric acid. 5 lbs. of ammonia thus combined beat 20 lbs. of Peruvian guano, and at a less cost. [See first experiment.] What the farmer wants is the true agricultural value of the fertilizer he uses; not its commercial value. If this could once be clearly established, the commercial value would at once be scaled down to the agricultural value. That which would pay the best would rise in the markets, and that which would not pay would soon depreciate.

EXPERIMENTS, (CONTINUED.)

8. As to the interchangeability of potash and soda; we took sand, washed it thoroughly so as to get out all the soluble matters, and filled two boxes of equal size. In each of them we put three ounces of sulphate of magnesia, sulphate of ammonia, and superphosphate of lime. To one we added three ounces of chloride of potassium; to the other three ounces chloride of sodium. The box containing the potash produced 61 grains of seed cotton, the stalk and roots weighing 520

grains. That containing the soda produced 31 grains of cotton, the stalk and its roots weighing 177 grains. The inference is that while potash is the most important of the two, soda may replace it to a certain extent.

9. The comparative value of potash and soda was more clearly demonstrated in another experiment, on the poorest spot in the field. We applied 40 ounces of superphosphate to two rows of cotton, each 54 yards long, adding to the one 12 ounces of muriate of potash, and to the other an equal amount of sulphate of soda. The potash row made 211 oz., the one with soda 162 oz., the natural soil 62 oz. In still another experiment, chloride of potassium was added to the ammoniated superphosphate, 6⅔ oz. for one row, and an equal quantity of sulphate of soda for another row. The potash formula produced 211 oz.; the soda formula 194 oz.; the natural soil 131 ounces.

10. We tested caustic lime as a chemical agent to disintegrate soils, and prepare soluble food for plants, as well as to decompose the organic matter of soils. At the rate of 100 lbs. per acre, on the poorest soil, it increased the product of seed cotton 101 lbs., which about paid for the investment. Chip manure added to the same quantity of lime, increased the product to 146 lbs. This experiment proves that lime will pay on soils abounding in organic matter, but on other soils it is of doubtful utility. The experiment needs to be repeated.

11. The comparative value of the bi-phosphate and di-phosphate of lime, was tested in two small experiments. I prepared a small quantity of the di-phosphate from phosphate of soda and lime water, and applied in a row of cotton twelve feet long. By its side an equal quantity of bi-phosphate was applied. The former produced 15 oz.; the latter, 21 oz. In another experiment, 7½ oz. of the di-phosphate was used in a row 17½ yards long; and in a row by its side, an equal quantity of superphosphate, equal to 2½ lbs. of bi-phosphate. Result of bi-phosphate 63 oz.; di-phosphate 62 oz.; natural soil 40 oz. From these rather imperfect experiments, the inference is that while the bi-phosphate is the best fertilizer when used uncombined, the di-phosphate is very good, and combined with ammonia would probably fall but little behind the bi-phosphate.

12. In an experiment on very thin land, we tested the minimum amount of ammoniated phosphate to be applied per acre. 100 lbs. paid for itself and a profit of $5.88 per acre. 50 lbs. made above cost $1.62. On land which produced 476 lbs. without manure, 200 lbs. per acre made 817 lbs. of seed cotton. 400 lbs. by its side, covered deep in the soil after a turning shovel run each way, produced 870 lbs., making a net profit of $4.07 per acre. The 200 lbs. made $8.28 above cost. 1,000 lbs. per acre on a soil which produced 776 lbs. without manure, made 1,361 lbs. at a loss of $7.15. Cotton at 17 cts. would have paid a small profit. This, no doubt, will pay a better per cent. the second year.

13. It has been supposed that soluble food applied to plants in the spring becomes exhausted before the crop is matured, and needs replenishing. On the 2d of July we applied to two rows in a middle shovel furrow, at the rate of 200 lbs. of ammoniated phosphate, where 300 lbs. had been previously applied under the cotton. In two adjoining rows 200 lbs. was applied broadcast. The former produced at the rate of 1,556 lbs. per acre; the latter, 1,447. The production without this last application being 1,312 lbs. of seed cotton, and that of the natural soil 776 lbs.

STABLE MANURE.

14. As stable manure is a powerful nitrogenous fertilizer, and deficient in phosphoric acid, we made an experiment combining the two, applying at the rate of one bushel of undecomposed fresh dung to a row 70 yards long, and to another the same amount of old rotted manure. The furrows were opened with a turning shovel, one run each way: the manure put in and bedded on, and at the time of planting 100 lbs. of high graded superphosphate put in with the seed. The row without manure, made at the rate of 457 lbs. per acre; the new stable manure 903 lbs.—being 97 per cent. on production; the old stable manure 892 lbs., being 95 per cent. on production.

15. An experiment with cotton seed, green, and having the germ killed, applied with superphosphate, resulted as follows: We applied 14 lbs. of each to a row 70 yards long, (equal to 30 bushels to the acre,) and 100 lbs. of superphosphate, at the time of planting, as in the last experiment.

The seed in both cases, was buried, after running two turning shovel furrows quite deep. Very few of the green seed came up, and hence but little of the nitrogen escaped. The germ of the other seed was killed by being steeped in boiling water. On this plat the natural soil made 435 pounds; the green seed 885 pounds—equal to 103 per cent. on production, and a net profit of $12.00 per acre. The killed seed produced at the rate of 915 pounds, equal to 110 per cent. on production, and making $13.30 net profit.

HOW TO MAKE COMPOST HEAPS.

The best method of husbanding all the nitrogen of stable manure and cotton seed is to keep your stalls well littered, so as to catch all the urine as well as dung. The urine is the most valuable part. Let it accumulate for twelve months, and get to be a foot deep, if need be. Then make your compost heaps under shelter. A layer of stable manure, say six inches, and a layer of cotton seed, well moistened, four to six inches. Then, if you choose, an inch of superphosphate, and so on. The heaps should be conical, and covered all over, six inches or more, with dry loam from under your houses, dry chip manure, or clay loam from the fields, well air dried. This will catch all the escaping ammonia manufactured in the interior of the heap, and be about as valuable as any. At the rate of fifty bushels to the acre in the bottom of your cotton beds, this should double the production.

VEGETABLE MANURES.

The importance of vegetable mould to be used in conjunction with fertilizers was tested as follows: One row, with enough mould from the woods to half fill the furrow, with ammoniated phosphate, at the rate of 220 lbs. per acre, made 990 lbs. seed cotton. The fertilizer with the mould, made 742 lbs.; the natural soil 432 lbs. The fertilizer, with the mould, made 128 per cent. on production; without it, only 71 per cent.; showing that the presence of organic matter in a soil adds much to its production when fertilizers are used.

The importance of husbanding the vegetable matter of the soil cannot be impressed too often or too deeply on the cultivators of the soil. Where a good crop of grass, weeds or of pea-vines or other plants have decayed in a soil, there is enough of all the mineral substances left in an available condition, except phosphoric acid to make a fair crop of any of the farm products. One thousand lbs. of grass decomposed in the soil will furnish four times as much potash as will be required to make one thousand pounds of corn or wheat, and half enough phosphoric acid, with quite an overplus of all the other mineral substances. The straw of the cereals will furnish more than enough of every one of them except magnesia and phosphoric acid; nearly enough of the former, and one-fourth enough of the latter. To make peas, there are enough of all the minerals in grass with quite an overplus except phosphoric acid; just half enough of this and double enough of potash. Pea vines furnish a superabundance of potash and lime to make both corn and peas, in fact of every mineral substance except phosphoric acid. There is about half enough of this to supply the demand. There is a sufficiency in grass to make the seed and fibre of cotton, of all these substances except magnesia and phosphoric acid. The stalks of cotton will also furnish enough of all the mineral food except potash, magnesia and phosphoric acid. These three are quite deficient. Thus allowing that the stalks of cotton left in a field, weigh as much as the seed taken from them, for every thousand pounds there will be taken away eight pounds of phosphoric acid in the seed, more than is left in the stalk; ten pounds of potash and six pounds of magnesia. And when it is remembered, under our system of clean culture, the cotton stalk is about all the organic matter left in the field, and the cattle takes off a good portion of this during the winter, it is not wonderful that our lands deteriorate, our crops rust and purses remain empty. The inference is clear from the above facts, that a good crop of grass and weeds, or other vegetable matter covered in the soil and properly decomposed, will furnish a sufficiency of all the mineral substances to make a good crop of corn, cotton or peas, except phosphoric acid; that a piece of land run in cotton for a number of years, will rapidly be deprived, not only of its nitrogen, but its phosphoric acid, and gradually of its potash and its magnesia; that in a system of rational agriculture, it is quite as important to husband the organic matter of the soil, as it is to apply fertilizers of any kind; that one of the most important processes for obtaining soluble mineral food for plants, is to furnish the land with vegetable matter by a proper rotation of crops; that the mineral substances of plants become, in the very process which dissolves them, available for a succeeding generation of vegetable growth, by the extreme mechanical fineness to which they are reduced, and the action upon them of the ammonia and carbonic acid, escaping from their albuminoids during the process of decay.

SOIL AND SUBSOIL.

17. The difference in the productive capacities of a soil and subsoil was tested as follows: We took two barrels, and filled one with surface soil, which was in good heart, and the other from the subsoil immediately beneath the place from which the first was taken. Both were then planted in cotton without the addition of anything except sufficient water to supply them with moisture. The seed in the surface soil came up quick and grew off rapidly, and would have made a good crop, but for the lack of room and a proper supply of moisture to the roots. The product was nine drachms of white cotton. In the subsoil, the seed failed to sprout the two first plantings, came up on the third, grew very slow, made two diminutive stalks, and produced in one small boll half a drachm of yellow cotton. I attributed the difference in production, first to the lack of æration, the soil being almost impermeable to water; second, the deficiency of organic matter in the subsoil; third. the lack of soluble mineral matter.

18. An experiment in the application of soluble phosphate of lime separated from the insoluble by water, gave very satisfactory results. We treated 13⅓ oz. of high graded superphosphate, with cold water, extracting 5½ oz. of bi-phosphate of lime, and applied it in the liquid form to 17½ yards of a row planted in cotton. This made 63 oz. of seed cotton—equal to 945 lbs. to the acre. The residue, being 8 oz. of di-phosphate, and tri-calcic phosphate with other insoluble matters, in an adjoining row, made 43 oz. equal to 645 lbs. per acre; 13⅓ oz. superphosphate put in dry, made at the rate of 870 lbs. per acre; the natural soil producing 480 lbs. Thus 66 oz. of bi-phosphate of lime applied as a liquid, made 465 lbs. more than the natural soil, leaving a valuable residue, which, being in part rendered soluble in the soil, made 165 lbs. more than the

natural soil. The liquid application paid for itself and made a net profit per acre of $15.10, leaving a residue (which cost nothing, as the whole cost is charged to the solution,) which applied to another row made $7.15 per acre. The dry application made $3.25 less per acre than the liquid, without reference to its residue. This remarkable result is no doubt owing to the fact, that soluble phosphate of lime being suspended in water, is relieved of all that cumbers or prevents its diffusibility. Hence, it spreads rapidly through the soil, so as to supply, not merely the central portion of the roots, but those extending laterally from the plant covering a much greater area of soil than when applied dry. This is proven in the fact that at the first picking, the solution only produced 19 oz., while the dry powder made 27 oz., and the natural soil 7 oz. The second picking, the liquid had 41 oz, the dry 29 oz., and the natural soil 22 oz. Here we perceive that the first roots found a surfeit in the dry application, while the latter formed rootlets further from the plant received but little more than that afforded by the natural soil. But the liquid application gave increased nourishment to the roots as they were extended farther from the plant. I believe this principle of diffusibility, as applicable to liquid manures especially, will have a fine effect in preventing the effects of drought, particularly as manifested in cotton rust. As to its practicability, liquid manures may be applied at about the same cost as dry manures. This shall be a prime experiment for the next season.

RICH AND POOR SOILS.

The true difference, chemically considered, between a rjch and a poor soil, on the theory of M. Grandeau, was tested with very satisfactory results. As a devotee of science, I have felt more interest in this experiment than perhaps any other. Heretofore chemistry has never been able to define exactly the laws which govern fertility. Liebig, who devoted a long life to agricultural chemistry, in his last work says. " chemical analysis gives but rarely a correct standard by which to measure the fertility of different soils, because the nutritive substances therein contained, to be really available and effective, must have a certain form and condition, which analysis reveals but imperfectly." M. Grandeau, who has charge of one of the experimental stations in France, and is the opponent and critic of M. Ville, concludes that the black matter which is precipitated from the humus of the soil by ammonia water, contains, in an assimilable form, the veritable food of plants. Professor Shepard, of Charleston, presented his theory in the *Rural Carolinian*, commenting favorably upon it, and I undertook to run an experiment, by which the comparative fertility of two soils could be tested, and he agreed to give an anylysis of the soils on M. Grandeau's plan for the benefit of science. I selected about the poorest and the richest spots in the field, planting rows of cotton without fertilizers, and carefully noting results. The rich soil made at the rate of 746 lbs. per acre of seed cotton; the poor soil only 247 lbs. The analysis of these two soils by Dr. W. D. Wamer, assistant of Dr. Shepard, gave the following results:

	RICH—*per ct.*	POOR—*per ct.*
Capillary moisture—i. e., expelled on air drying	13.645	9.688
Hygroscopic moisture—i. e., expelled at about 212°F.	1.244	0.629
Organic matter and water of combination expelled at a low red heat	4.326	2.440
Fixed ingredients	80.785	87.243
Total	100.00	100.00

The amount of nitrogen in the thoroughly air dry soils were as follows:

Rich soil, am't of nitrogen, 0.102	Poor soil, am't of nitrg'n, 0.165
Equivalent in ammonia, 0.125	Equivalent in ammonia, 0.079

The analyses given below, were made on the plan proposed by M. Grandeau:

In 1,000 grains of air-dried soil, ingredients of plant food:

	RICH.	POOR.
Phosphoric acid	0.154	0.106
Sulphuric acid	0.128	0.168
Silicic acid, soluble in dilute acids	0.292	0.429
Potash	0.022	0.025
Soda	0.017	0.015
Magnesia	0.352	0.584
Lime	0.132	0.121
Iron, oxide and alumina	0.840	0.252
Total, determined fixed ingredients	1.937	1.700
Fixed ingredients undetermined (largely silica)	0.043	0.400
Organic matter	13.047	7.662
Total humus ("matiere noire)	15.027	9.872

Prof. Shepard says: "From the results thus given, it would seem that the greater productiveness of the rich soil was due to the much greater amount of organic matter incorporated in the humus, as well as (perhaps,) to the fifty per cent. more phosphoric acid in an available form for plant food."

This is a remarkable exposition, and while I am not prepared to adopt in toto M. Grandeau's views, I believe that he has made a decided step forward, and, as Prof. Shepard has elsewhere said, the investigations thus far made favor his theory. Here we have out of one thousand pounds of rich soil 15.027 of black matter, (humus in its widest sense,) and in the poor soil 9.782. It is clear that outside of this, all is insoluble and unfit for plant food, i. e., in its present form. Of the organic matter, nitrogen is admitted to be the most essential element, the only one, in fact, needed to be applied to a soil. Of this there was in the rich soil 0.102, a little more than one pound in a thousand; in the poor soil 0.065, say two-thirds of a pound—showing a difference of fifty-seven per cent. of this important element in favor of the rich soil. A good portion of this was doubtless in the form of ammonia, being absorbed and held by the organic matter. Of the mineral matter, there is only 1.970, less than two grains, in the rich soil, and 2.120, a little more than two, of the poor soil, found in the humus. Of this .043 in the rich, and 0.420 in the poor, is undetermined, but mostly silica. Ruling out iron and alumina as not essential for plant food, (only in the merest traces, and then possibly accidental,) we find that the poor soil has more available plant food than the rich, viz: as 1.448 is to 1.097. The four important mineral substances—silica, magnesia, sulphuric acid and potash—all exist more abundantly in the poor than the rich soil, while lime and soda have only a small per cent. more in the rich than the poor soil. Then it is certain that the application of any of these substances to this poor soil would not increase its fertility, as mere food; possibly they might act chemically on the organic matter or the inorganic soil, in preparing more soluble food for plants. The only difference, then, in the mineral elements of any note, is in the phosphoric acid, there being 0.154 in the rich and 0.106 in the poor soil. Even this would be less available on a poor soil than a rich one, as it is soluble in ammonia and not in water, and the rich soil would have more ammonia and more carbonic acid than a poor one to aid in making the phosphoric acid soluble. It is remarkable that the per cent. of nitrogen stands in such close relation to that of the organic matter. Thus in the rich soil the organic matter is 64.96 and the nitrogen 35.04, while in the poor soil the organic matter is 65.79 per cent. and the nitrogen 34.21. Then it is clear that the difference between the two soils is that the rich has more organic matter and consequently more nitrogen and also more available phosphoric acid than the poor.

SUBSOILING.

20. Subsoiling land for cotton. One-fourth of an acre subsoiled 12 inches deep, four feet wide, using at the rate of 300 lbs. of ammoniated phosphate, produced at the rate of 1,227 lbs. per acre. The same amount not subsoiled, by its side, produced 1,012 lbs. The first paid for the fertilizer and made a clear profit of $16.38 per acre. The last made a profit of $7.03.

21. By way of testing the proper thickness to plant cotton, I took one-fourth acre and planted it four feet wide, applying 200 lbs. of fertilizer to the acre. Four rows chopped out as usual, and left only one stalk in the hill, produced at the rate of 914 lbs. per acre. Two stalks produced 872 lbs. Three stalks 884. The difference would doubtless have been greater in favor of thin planting had it been an unseasonable year.

22. Early, medium, and late planting of cotton, was tested with the following results: That planted on the 10th of April, without fertilizers, (being 5 rows 70 yards,) made at the rate of 492 lbs. per acre; on the 10th of May, 276 lbs.; on the 24th of May, 276 lbs. That fertilized and planted first, made 801 lbs.; the medium planting, (10th May, 834 lbs.; the last (24th May,) 538 lbs. Thus it is seen that the May planting, both with and without fertilizers, beat the early planting in April. The last planting would have done much better but for the caterpillars, which destroyed a good part of the crop.

TOPPING COTTON.

23. *Experiments in topping Cotton.*—On this plat 300 lbs. of ammoniated phosphate had been applied, and the cotton was in a flourishing condition throughout the season. That topped

on the 2d of July produced at the rate of 1297 lbs. per acre; that on the 21st July 1323, and that on the 6th August 1290 lbs. The average of the three topped rows was 1303 lbs., of those not topped, 1387 lbs. The first picking of the topped rows gave 422 oz.; not topped, 387. Second picking of topped, 474 oz.; not topped, 567. Two last pickings of topped, 147 oz.; not topped, 164 oz. Hence the first picking shows. that the cotton topped was considerably ahead of that not topped, showing clearly that the tendency to go to weed was checked, and the force expended on the bolls. The two last pickings, however, that was not topped was largely in advance of that topped. The inference is clear that all the good accomplished by topping cotton is to mature the bolls already formed, at the expense, however, of new ones to be formed.

24. *The proper width to plant cotton* was tested on a section of thin land, to which 200 lbs. of ammoniated superphosphate was applied per acre, and four rows appropriated to each. which were all left one and two stalks in the hill The rows 2½ feet wide produced at the rate of 784 lbs. per acre; those 3 feet wide, 744 lbs.; 3½ feet wide, 715 lbs., and 4 feet, 701 lbs. In philosophising upon this difference in favor of close planting, there are three causes which seem to operate. 1st. The fertilizer is disseminated over a larger space, consequently more roots feed upon it, with less damage as to dry weather. Thus 200 lbs. is scattered in a line of 5,800 yards in 2½ feet rows, while in 4 feet rows it extends only 3,800 yards. 2d. In wide rows there are fewer feeders at work to take up the soluble matters in the middles of the rows.

MANURE AND CULTURE FOR CORN.

25. As to preferred manure for Indian corn, we used chloride of potassium, superphosphate of lime, sulphate of ammonia and sulphate of lime, each separately and combined. The chloride of potassium made at the rate of five and two-third bushels more than the natural soil per acre, which did not pay for the outlay. The superphosphate was the next best, then the sulphate of lime and then the sulphate of ammonia. Strange to say, the combination of ammonia, phosphoric acid and potash, which acts so powerfully on cotton did not do so well as some of the salts singly. I do not regard the experi-

ment as a fair one, inasmuch as I found afterwards that a part of the land had been an old garden spot, which in part accounted for the strange results.

26. Subsoiling land for corn was tested as follows: One-half acre was planted and cultivated precisely the same way, with a small amount of ammoniated superphosphate applied in each hill. The corn was planted in rows six feet wide by three in the drill, one-fourth acre was subsoiled 12 inches deep just previous to planting. The subsoiled plat produced at the rate of 19.70 bushels to the acre. That not subsoiled, 17.34 bushels. The overplus of corn made, about paid for the extra labor. A dry year it would doubtless have paid more.

27. Deep and shallow culture of corn. Two sections, one-fourth acre in each, was planted on as equal land as possible and treated in the same way, only one was ploughed with a long shovel, and the other with a sweep, after the first plowing. The deep culture produced at the rate of 17.95 bushels per acre; the shallow culture 17.50 bushels. The surplus made by deep plowing about compensated for the extra number of rows needed to be run by the shovel. I think, in our red stiff lands, corn should be plowed with a shovel every time, except the last, then lay by with the sweep. In sandy soils the sweep may be used exclusively after proper preparation. But when it is remembered that in many ef our soils the ground runs together so as to prevent not only the circulation of the roots, but the free access of air, we cannot overestimate the value of keeping a good tilth, even at the expense of a few fibrils which run out early in quest of food. The cotton plant requires shallow culture after the fruit begins to form, as it is much slower in regaining its lost feeders than corn.

28. The proper width for planting corn, was tested with the following results: Rows four feet wide produced 18.60 bushels per acre. Five feet wide, 19.45 bushels. Six feet wide, 15.96, and seven feet 16.57 bushels. The land was in good heart, well fertilized, and the corn averaged about three feet in the rows. As a general rule, good land, good cultivation and good seasons will bear corn planted thicker than when the reverse is the case.

PULLING FODDER.

29. The effect of stripping the blades for fodder on the production of corn, was tested on a half acre, with the following results: The rows which were left unstripped, producod at the rate of 21.60 bushels per acre. Those which were stripped produced 20.89 bushels. The value ot the acre of corn from which the fodder was not gathered, at the market price, was $23.79. That from which it was gathered amounted to $21.97. The fodder itself (327 lbs.) was worth $5.90, making $3.11 in favor of pulling the fodder. It is proper to state that a bushel of corn, where the fodder was not gathered, weighed 1$\frac{1}{5}$ lbs. more than the other. I am satisfied that the injury supposed to result to corn from stripping the blades after it passes the milk state, has been overrated. That the leaves at this stage, have about fulfilled their office in supplying nourishment to the seed, and that when the corn is getting hard and the blades begin to die, no decided injury can accrue to the corn. In fact, that it is a most economical process, saving about the same value in corn, and securing a cheap and valuable fodder, (just at a time when the farm hands have nothing else to do,) which cannot be substituted by any thing else in our warm climate, as provender for horses.

BEANS, PEAS, ETC.

30. Is potash the preferred food for leguminous plants? M. Ville has so announced from experiments made by him. We are not prepared to adopt, as yet, the idea of a preferred manure. We suppose that the presence of a preferred manure so-called, would do no good in the absence of any other essential ingredient, and that a plant which flourishes in a soil under the application of a particular ingredient, does so because of a deficiency being supplied to the soil. Three rows 70 yards long, were planted in corn-field peas, on one of which we put 24 oz. superphosphate; on another 24 oz. of chloride of potassium, and a third a combination of carbonate and sulphate of ammonia. The superphosphate row produced 12 lbs. 7 oz. of peas: the potash row 5 lbs. 6 oz., and that with ammonia 5 lbs. 2 oz. The phosphate row grew off much more luxuriantly than the others, producing as much more foliage than the others as it did of seed. We suppose that this substance was

simply deficient in the soil in an available form, and that on this account and not because the pea preferred it, did it excel the other fertilizers.

TURNIPS AND SHEEP HUSBANDRY.

31. The effect of superphosphate of lime on turnips, was to me unusually interesting because of its connection with sheep husbandry. I sowed Ruta Bagas, Red Top, Globe, Flat Dutch, Norfolk and Hanover. The Red Top was the most prolific, yielding at the rate of 220½ bushels to the acre, fertilized with 300 lbs. of ammoniated phosphate; the natural soil by its side producing 46 1-5 bushels. The season was very dry and unwholesome, and the stand very imperfect. Double the amount would have been produced under more favorable circumstances. The Flat Dutch made 168 bushels, Ruta Bagas 136½, Hanover 126, the Globe 121, and the Norfolk 99¾. Five rows, without manure, planted in Ruta Bagas, produced on an average, 46⅕ bushels per acre. The Ruta Bagas and Hanover have the most nourishment in them for stock, and keep the best during the winter. We tried, on a very thin soil, the effect of 50 lbs. of superphosphate per acre, at a cost of $1.25 planted in Ruta Bagas; the natural soil produced 21 bushels, the fertilized 84, with about half a stand.

The turnip crop (which is considered the sheet-anchor of English husbandry, furnishing the staple food for their sheep, which in its turn is converted into wool and mutton, to clothe and feed her population, and by their droppings keeping their lands rich with nitrogen and valuable salts,) has been confined to gardens and patches in this country, especially at the South. I am satisfied, that with proper attention, it may become an important crop in Georgia, adding to our wealth not only on account of the mutton, wool and nitrogen produced by it, but instituting a profitable division of labor for our farmers, by which less cotton would be produced and better prices secured.

I would suggest the following plan, subject to such modifications as circumstances might seem to demand: A man with 25 sheep, should select four acres of poor land and plant in turnips, putting 200 lbs. of superphosphate under them. The very best article in market, with 33 per cent. soluble phosphate of lime, would cost him not exceeding $5 to the acre.

Charge this and the flock of sheep to sheep husbandry. Have two acres in Red Tops or Flat Dutch, and two in Ruta Bagas, with a hurdle fence sufficiently large to enclose the flock of sheep. Begin to feed on the red tops as soon as matured, changing the hurdles as the plat is eaten out, and turning over the trodden ground with a turning shovel at convenient times, so as the better to secure the value of the manure. The early turnips would be eaten before the severe freezes of winter, and then the ruta bagas could be brought into use. By April the four acres could be planted in cotton, and four acres by its side also planted as a test. Whatever amount of cotton was made by the manured plat over the other, should be credited to sheep husbandry, as well as the wool, the mutton and the increase. In my opinion, wool could be made much cheaper per lb. in this way than cotton.

Boussingault made an experiment with 200 sheep, on a stubble, for one fortnight. He found that each sheep manured a surface of four square feet every night, so as to produce a maximum crop of turnips. At this rate, a flock of 200 sheep would make 26 acres of land rich in one year. Estimating that each acre would make 300 lbs. more of seed cotton than the natural soil, (very moderate for a maximum crop,) the 200 sheep would make $390, at 15 cents for cotton the first year, to say nothing of the valuable salts left in the land for succeeding crops. The value of the wool and mutton, and increase of the lambs would be added to this. What an immense source of wealth to the country sheep husbandry might be made, if this plan was carried out!

During the spring, the sheep might be fed on barley, rye, grass and millet crops, till July, and then these plats might be sowed in turnips, and save even the outlay for superphosphates, going through the same same process in preparation for corn the next year. The excrement of sheep is twice as valuable as that of other quadrupeds, having much less water, and about twice as much nitrogen.

SUMMARY.

To sum up the practical bearings of these experiments—they teach,

1. That there is a great waste of ammonia when Peruvian

guano is used in its concentrated form; it should be mixed with superphosphate, alkaline salts, etc.

2. That no combination of salts, leaving out soluble phosphoric acid, will pay on our worn soils.

3. That taken separately, none of the salts sold as fertilizers to make home compounds, will pay. Their virtues, if any, must be in chemical action upon each other, and the substances with which they are composted.

4. That ashes treated with sulphuric acid will greatly improve their fertilizing qualities.

5. That 200 lbs. of a good ammoniated superphosphate is about the quantity to be used on an acre of cotton.

6. That a soil abounding in vegetable matter will pay a much better per cent. with commercial fertilizers than one having but little of this substance.

7. That a large amount of fertilizers (say half a ton per acre) will not pay with low priced cotton.

8. That with good cultivation, good fertilizers will pay, even at the lowest rates of cotton; but with bad cultivation, they will hardly pay at any price.

9. That while potash is more indispens~~i~~able to plant life than soda, the latter may partially replace the former under certain circumstances.

10. That the di-phosphate of lime, being less soluble in cold water, is not so efficient as the bi-phosphate as a fertilizer.

11. That stable manure, either fresh or rotted, applied with a high graded superphosphate, makes a very efficient fertilizer for cotton.

12. That cotton seed applied with the germ killed, (or green, if put in deep,) in conjunction with a good superphosphate, makes a powerful fertilizer.

That lime should never be used in conjunction with a superphosphate, and the application of superphosphates to calcareous soils is of doubtful utility.

14. Fertilizers applied during the growth of the crop, to keep up a supply of nutrition to the rootlets, will not pay under ordinary circumstances.

15. That ammonia is the most active and efficient form of nitrogen, when applied as a fertilizer, and that organic nitrogen in certain albuminoids is more effectual than the nitrates.

16. That the value of nitrogen and phosphoric acid to a farmer, depends on their forms and combinations, not their commercial value—which is rated according to the law of supply and demand

17. That the application of soluble manures in a liquid form, is better and more efficient than when applied in the dry state.

18. That lime will pay on soils abounding in organic matter; on other soils its application is of doubtful utility.

19. That subsoils do not germinate seeds or grow plants like surface soils.

20. That early planting of cotton will not produce as much as that planted later, when the ground becomes warm and the plant is not retarded, but grows off vigorously and healthy.

21. That subsoiling cotton lands will pay for the extra labor on our clay soils.

22. That one stalk in the hill will produce more cotton than two or more stalks.

23. That topping cotton is rather a detriment than an advantage to the crop.

24. That cotton planted in narrow rows, 2½ feed wide, and fertilized on thin land, will produce more fruit than in wider rows, of a scasonable year.

25. That the difference between a rich and poor soil is probably owing to the amount of available nitrogen and phosphoric acid, held in soluble conditions with the humus or black matter resulting from the decay of plants, in which there is always a sufficiency of the other mineral elements.

26. That subsoiling land for corn, will pay for the extra labor, even of a seasonable year, much better of a dry year.

27. That deep ploughing of corn during some seasons, at least on clay land, seems to answer as well, if not better, than shallow culture.

28. That five by three feet is the best distance to plant corn on medium land, of a seasonablo year.

29. That pulling fodder does not seriously injure the corn after it passes the milk stage.

30. That superphosphate is the best fertilizer for leguminous plants—not because it is a preferred food, but because available phosphoric acid is deficient in our soils.

31. That large crops of turnips can be made on thin lands, by the application of superphosphate of lime, and inferentially sheep husbandry might be made profitable by feeding on turnips and fertilizing the soil, as well as for the wool and mutton, and the consequent reduction of the amount of cotton by the division of labor.*

REPORT OF H. C. WHITE,

PROFESSOR OF CHEMISTRY.

Commercial Fertilizers--Chemistry of the Cotton Plant.

During the past year, the instruction given to students in this Department, embraced the subjects of General Chemistry, Industrial Chemistry or Technology, Analytical Chemistry, Agricultural Chemistry, and Mineralogy and Geology. Especial attention was devoted to the class in Analytical Chemistry, working practically in the Laboratory, and with increased means it is hoped to extend largely this character of instruction.

In the private Laboratory of the College, two works were undertaken. The first was the analysis and estimation of commercial values of fertilizers offered for sale in the State. The second was the analysis of different parts of the Cotton Plant, so as to present, as completely as possible, its chemical history.

I.—COMMERCIAL FERTILIZERS.

Without attempting to determine the relative *agricultural* values of these, which it may be assumed it is beyond the power of chemical analysis to do, correspondence was entered into with a large number of manufacturers and dealers in the articles used in the manufacture of commercial fertilizers, and quotations received of the prices for which the chief elements

---

*The term *bi-phosphate* in this report denotes monocalcic phosphate; and the term *di-phosphate* denotes bicalcic phosphate.

of fertility contained in these could be obtained. After careful examination, and the exercise of what was deemed due judgment, the following prices per pound for cash, in currency, in Savannah, were determined upon as proper for the following named articles for the present year:

Phosphoric Acid, soluble in water	16¾ cts.
Reduced Phosphoric Acid	16¾ “
Insoluble Phosphoric Acid	5½ “
Potash	6¼ “
Nitrogen	30 “

The samples, of which the analyses were made, were selected by the Secretary of the Agricultural Society, with care, and forwarded to this laboratory in sealed packages, each designated by number, the name corresponding to which was retained by him and published with the report of the analysis furnished.

The following twenty-four commercial fertilizers have been reported upon at this time, and others are now the subject of examination.

SAMPLE MARKED “1.”

Etiwan Dissolved Bone, sold in Atlanta at $45 per ton.

	P'R C'T.	*Commercial value per ton, (2000 lbs.)*		
Moisture and volatile matter,	25.90	206.8 lbs.	Soluble Phos. Acid,	$34.64
Non-volatile matter,	74 10	38.2 “	Red'd “ “	6.40
Sand and clay,	14.33	15.0 “	Insoluble Phos. Acid,	0.83
Phosphoric Acid soluble in wat'r,	10.34			
Reduced Phosphoric Acid,	1.91			$41.87
Insoluble Phosphoric Acid,	0.75			

SAMPLE MARKED “2.”

Etiwan Guano, sold in Atlanta at $60 per ton.

	P'R CT.	*Commercial value per ton (2,000 lbs.)*		
Moisture and volatile matter,	37.94	163.4 lbs.	Solnble Phos. Acid,	$27 38
Non-volatile matter,	62.06	32.4 “	Redc'd “ “	5 43
Sand and clay,	9.88	15.6 “	Insol'e “ “	86
Phosphoric acid, sol. in water,	8.17	19.6 “	Potash,	1.23
Reduced Phosphoric acid,	1.62	20.6 “	Nitr'n (= 25 lbs. am.)	6.18
Insoluble Phosphoric acid,	0.78			
Potash,	0.98			$41 08
Nitrogen, (= ammonia 1.25)	1.03			

SAMPLD MARKED “3.”

Soluble Pacific Guano, sold in Atlanta at $50 per ton.

	P'R C'T.	*Commercial value per ton (2000 lbs.)*		
Moisture and volatile matter,	$41.59	82.6 lbs.	Soluble Phos. acid,	$13 84
Non-volatile matter,	58.41	10.0 “	Redc'd “ “	1 67
Sand and clay,	8.03	129.4 “	Insol'e “ “	7 12
Phosphoric acid, sol. in water,	4.13	20.4 “	Potash,	1 28
Reduced Phosphoric Acid,	0.50	36.2 “	Nitrog. (= 44.0 amm.)	10 86
Insoluble Phosphoric acid,	6.47			
Potash,	1.02			$34 77
Nitrogen, (— 2.20 ammonia,)	1.81			

SAEPLE MARKED "4."

Sea Fowl, sold in Atlanta at $50 per ton.

	P'R C'T.	*Commercial value per ton* (2.000 *lbs.*)		
Moisture and volatile matter,	44.31	135.8 lbs.	Soluble Phos. acid,	$22 75
Non-volitile matter,	55.69	61.4 "	Red. Phos. acid,	10 28
Sand and clay,	8.58	35.0 "	Insol. Phos. acid,	1 92
Phosphoric acid sol. in water,	6.79	10.8 "	Potash,	68
Reduced Phosphoric acid,	3·07	41.0 "	Nit. (=55.4 amm.)	12 30
Insoluble Phosphoric acid,	1.75			
Potash,	0.54			$47 93
Nitrogen (=2,77 ammonia,)	2.05			

SAMPLE MARKED "5."

Peruvian, sold in Atlanta at $85 per ton.

	P'R CT.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	59.92	42.8 lbs.	Soluble Phos. acid,	$ 7 17
Non-volatile matter,	40.08	196.6 "	Redc'd " "	32 93
Sand and clay,	6.54	63.8 "	Insol. " "	3 51
Phosphoric acid, sol. in water,	2.14	40.6 "	Potash,	2 54
Reduced Phosphoric acid,	9.83	144.4 "	Nitrog. [=175.4 am.)	43 32
Insoluble Phosphoric acid,	3.19			
Potash,	2.03			$89 47
Nitrogen (= 8.77 ammonia,)	7.22			

SAMPLE MARKED "6."

English Dissolved Bone, sold in Atlanta at $55 per ton.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	24.55	230.8 lbs.	Soluble Phos. acid,	$38 66
Non-volatile matter,	75 42	48.2 "	Red'd " "	8 07
Sand and Clay,	4.72	21.0 "	Insol. " "	1 16
Phosphoric acid, sol. in water,	11.54			
Reduced Phosphoric acid,	2.41			$47 89
Insoluble Phosphoric acid,	1.05			

SAMPLE MARKED "7."

Currie's Ammoniated Flour of Raw Bone, sold in Atlanta at $50 per ton.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	33.39	11.6 lbs.	Soluble Phos. acid,	$ 1 94
Non-volatile matter,	66 61	108.6 "	Redc'd " "	18 19
Sand and clay,	1.98	411.2 "	Insol. " "	22 62
Phosphoric acid, sol. in water,	0.58	51.4 "	Nitrog. (=62 4 amm.)	15 42
Reduced Phosphoric acid,	5.43			
Insoluble Phosphoric acid,	20.56			$58 17
Nitrogen (=3.12 ammonia,)	2.57			

SAMPLE MARKED "8."

Russell Coe's Superphosphate of Lime, sold in Atlanta at $58.

	P'R CT.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	47.47	265.0 lbs.	Soluble Phos. acid,	$44 39
Non-volatile matter,	52.53	14.8 "	Reduc'd " "	2 48
Sand and clay,	2.95	15.0 "	Insol. " "	83
Phosphoric acid, sol. in water,	13.25	17.0 "	Nit. (= 20.6 amm.	5 10
Reduced Phosphoric acid,	0.74			
Insoluble Phosphoric acid,	0.75			$52 80
Nitrogen (= 1.03 ammonia,)	0.85			

SAMPLE MARKED "9." (*)

Patapsco Guana sold in Atlanta at $60 per ton.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	45.77	71.0 lbs.	Soluble Phos. acid,	$11 89
Non-volatile matter,	54.23	14 2 "	Redu'd " "	2 38
Sand and clay,	3.08	87.6 "	Insol. " "	4 81
Phosphoric acid, sol. in water,	3.55	22.2 "	Nitrog. (=27.0 amm.)	6 66
Reduced Phosphoric acid,	0.71			———
Insoluble Phosphoric acid,	4 38			$25 74
Nitrogen, (=1.35 ammonia,)	1.11			

SAMPLE MARKED "10." (†)

Chesapeake Guano, sold in Atlanta at $60.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	39.58	59 0 lbs.	Soluble Phos. acid,	$ 9 88
Non-volatile matter,	60.42	5.0 "	Redu'd " "	0 84
Sand and clay,	5.38	164 8 "	Insol. " "	9 06
Phosphoric acid, sol. in water,	2.95	41.8 "	Notrog. (= 50.8 amm.)	12 54
Reduced Phosphoric acid,	0.25			———
Insoluble Phosphoric acid,	8.24			$32 32
Nitrogen, (=2.54 ammonia,)	2.09			

SAMPLE MARKED "11."

Logan Fertilizer, sold in Macon at $50 per ton.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)		
Moisture and volatile matter,	28.86	242.2 lbs.	Soluble Phos. acid,	$40 57
Non volatile matter,	71.14	21.0 "	Reduc'd " "	3 63
Sand and clay,	5.44	6.4 "	Insoluble " "	0 35
Phosphoric acid soluble in water,	12.11			———
Reduced Phosphoric acid,	1.05			$44 55
Insoluble Phosphoric acid,	0.32			

SAMPLE MARKED "12."

Hunt, Rankin & Lamar's Home-Made Fertilizer, Formula No. 1, sold in Macon at $63.75 per ton.

	P'R C'T.	*Commercial value per ton,* (2,000 *lbs.*)		
Moisture and volatile matter,	29.83	60.2 lbs.	Soluble Phos. acid,	$10 08
Non-volatile matter,	70.17	7.2 "	Reduc'd " "	1 21
Sand and clay,	3.58	18.6 "	Insoluble " "	1 02
Phosphoric acid, soluble in water,	3.01	46 8 "	Potash " "	2 93
Reduced Phosphoric acid,	0.36	40.4 "	Nitrogen (= 49 pounds hmmonia,	12 12
Inseluble Phosphoric acid,	0.93			———
Potash,	2.34			$27 36
Nitrogen (= ammonia, 2.45)	2.02			

SAMPLE MARKED "13."

Hunt, Rankin & Lamar's Home-Made Fertilizer, Formula No. 2, sold in Macon at $66 per ton.

	P'R CT.	*Commercial value per ton* (2,000 *lbs.*)	
Moisture and volatile matter,	24.45	56.8 pounds Nitrogen (=68.9 lbs. ammonia,	$17 04
Non-volatile matter,	75 55		
Sand and clay,	1.02		
Phosphoric acid,	a trace.		
Nitrogen (= ammonia 3.10)	2.84		

(*) This sample, No. 9, also contained 3.93 per cent. of Phosphoric acid in combination with iron and alumina not estimated above, being regarded of but little agricultural value.

(†) This ample, No. 10, also contained 2.24 per cent. of Phosphoric acid in combination with iron and alumina not estimated in the analysis, being regarded of but little agricultural value.

SAMPLE MARKED "14."

E. Frank Coe's Ammoniated Bone Superphosphate, sold in Savannah at $55 per ton.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)	
Moisture and volotile matter,	53.05	209.0 lbs. Soluble Phos. acid,	$34 00
Non-volatile matter,	46.95	31.0 " Reduc'd " "	4 20
Sand and clay.	2.85	11.6 " Insolub. " "	0 64
Phosphoric acid, solub. in water,	10.45	52.6 " Nitrogen (=63.8 lbs.	
Reduced Phosphoric acid,	1.55	ammonia,)	15 78
Insoluble Phosphoric acid,	0.58		
Nitrogen (=ammonia 3.19)	2.63		$54 62

SAMPLE MARKED "15."

Peruvian—Guanape—sold in Savannah at $60, gold.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)	
Moisture and volatile matter,	59.17	46.2 lbs. Soluble Phos. acid,	$ 7 74
Non-volatile matter,	40 83	195 8 " Reduc'd " "	32 80
Sand and clay,	2.90	20.2 " Insolub. " "	1 11
Phosphoric acid, solub. in water,	2.31	37.8 " Potash,	2 36
Reduced Phosphoric acid,	9.79	183.6 " Nitrogen (=223 lbs.	
Insoluble Phosphoric acid,	1.01	ammonia,)	55 08
Potash,	1.89		
Nitrogen (=ammonia 11.14)	9.18		$99 09

SAMPLE MARKED "16."

Peruvian—Chincha—sold in Savannah at $67.50, gold.

	P'R C'T.	61.4 lbs. Soluble Phos. acid,	$10 28
Moisture and volatile matter,	39.70	13.6 " Reduc'd " "	2 28
Non-volatile matter,	60 30	8.2 " Insolub. " "	0 45
Sand and clay.	21.53	10.8 " Potash,	0 68
Phosphoric acid soluble in water,	3.07	108.6 " Nitrogen (=131.8 lbs.	
Reduced Phosphoric acid,	0.68	ammonia,)	32 58
Insoluble Phosphoric acid,	0 41		
Potash,	0.54		$46 27
Nitrogen (=ammonia 6.59,)	5 43		

SAMPLE MARKED "17."

Langdale Guano, sold in Savannah at $50.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)	
Moisture and volatile matter,	25.29	194.4 lbs. Soluble Phos. acid,	$32 67
Non-volatile matter,	74.71	14.8 " Reduc'd " "	2 46
Sand and clay,	5.00	20.4 " Insolub. " "	1 13
Phosphoric acid soluble in water,	9.72		
Reduced Phosphoric acid,	0 74		$36 26
Insoluble Phosphoric acid,	1.02		

SAMPLE MARKED "18."

Langdale Complete Guano, sold in Savannah at $67.50 per ton.

	P'R C'T.	*Commercial value per ton* (2,000 *lbs.*)	
Moisture and volatile matter,	31.70	207·0 lbs. Soluble Phos. acid,	$34 67
Non-volatile matter,	68.30	32.4 " Reduc'd " "	5 43
Sand and clay,	3 24	52.6 " Insolub. " "	2 89
Phosphoric acid, solub in water,	10.35	91.6 " Potash,	5 73
Reduced Phosphoric acid,	1.62	45.0 " Nitrogen (=54.6 lbs.	
Insoluble Phosphoric acid,	2.63	ammonia,)	13 50
Potash,	4.58		
Nitrogen (=ammonia 2.73)	2.25		$62 22

SAMPLE MARKED “19.”

Stonewall Fertilizer, sold in Savannah at $67.50 per single ton, and $60 wholesale.

	P'R CT.
Moisture and volatile matter,	34.88
Non-volatile matter,	65.12
Sand and clay,	2.86
Phosphoric acid, solub. in water,	6.43
Reduced Phosphoric acid,	1.07
Insoluble Phosphoric acid,	5.55
Potash,	7.68
Nitrogen (=3.12 ammonia,)	2.57

Commercial value per ton (2,000 *lbs.*)		
128.6 lbs.	Soluble Phos. acid,	$21 54
21.4 “	Reduc'd “ “	3 58
111 0 “	Insolub. “ “	6 10
153.6 “	Potash,	9 60
51.4 “	Nitrogen (=62.4 lbs. ammonia,)	15 32
		$56 24

SAMPLE MARKED “20.”

English Superphosphate of Lime, sold in Savannah at $50 per single ton, and $40 wholesale.

	P'R C'T.
Moisture and volatile matter,	27.36
Non-volatile matter,	72 64
Sand and clay,	2.08
Phosphoric acid, solub. in water,	16 29
Reduced Phosphoric acid,	0.57
Insoluble Phosphoric acid,	4.86

(*Commercial value per ton* (2,090 *lbs.*)		
325.8 lbs.	Soluble Phos. acid,	$54 57
11.4 “	Reduc'd “ “	1 91
97.2 “	Insolub. “ “	5 85
		$61 33

SAMPLE MARKED “21.”

Zell's Ammoniated Bone Superphosphate, sold in Savannah at $55 per ton.

	P'R C'T.
Moisture and volatile matter,	34.63
Non-volatile matter,	65.37
Sand and clay,	7.56
Phosphoric acid, solub. in water,	4.59
Reduced Phosphoric acid,	0.10
Insoluble Phosphoric acid,	5.52
Nitrogen (=2.30 ammonia,)	1.89

Commercial value per ton (2,090 *lbs.*)		
91.8 lbs.	Soluble Phos. acid,	$15 38
2.0 “	Reduc'd “ “	33
110.4 “	Insolub. “ “	6 07
37.8 “	Nitrogen (=46.0 lbs. ammonia,(	11 34
		$33 12

SAMPLE MARKED “22.”

Phœnix Guano, sold in Savannah at $47.50 per ton.

	P'R C'T.
Moisture and volatile matter,	25 76
Non-volatile matter,	74 24
Sand and clay,	1.52
Phosphoric acid, soluble in water,	4.35
Reduced Phosphoric acid,	2.69
Insoluble Phosphoric acid,	7.95
Nitrogen (=1.23 ammonia,)	1.02

Commercial value per ton, 2,000 *lbs*		
87.0 lbs.	Soluble Phos. acid,	$14 54
53.8 “	Reduc'd “ “	8 95
359.0 “	Insolub. “ “	19 74
20.4 “	Nitrogen [=24.6 lbs. ammonia,	6 12
		$49 35

SAMPLE MARKED “23.”

Mapes' Nitrogenized Superphosphate of Lime.

	P'R C'T.
Moisture and volatlie matter,	48.25
Non-volatile matter,	51.75
Sand and clay,	4.34
Phosphoric acid, soluble in water,	4.58
Reduced Phosphoric acid,	1.32
Insoluble Phosphoric acid,	8.48
Nitrogen [=3.10 ammonia,]	2.56

Commercial value per ton, 2,000 *lbs.*		
91.6 lbs.	Soluble Phos. acid,	$15 29
26.4 “	Reduc'd “ “	4 42
169.6 “	Insoluble “ “	9 33
51.2 “	Nitrogen [=62.0 lbs. ammonia,]	15 36
		$44 40

SAMPLE MARKED "24."

Soluble Pacific Guano, sold in Savannah at $50 per ton.

	P'R C'T.	*Commercial value per ton, 2,000 lbs.*		
Moisture and volatile matter,	42.90	114.4 lbs.	Soluble Phos. acid,	$19 16
Non-volatile matter,	57.10	59.8 "	Reduc'd " "	9 85
Sand and clay,	5.12	192.8 "	Insoluble " "	10 60
Phosphoric acid, soluble in water,	5.72	42.6 "	Potash,	2 66
Reduced Phosphoric acid,	2.94	41.2 "	Nitrogen [=50 lbs. ammonia]	12 36
Insoluble Phosphoric acid,	9.64			
Potash,	2.13			
Nitrogen [=2.50 ammonia,]	2.06			$54 63

II.—THE CHEMISTRY OF THE COTTON-PLANT.

In investigating this subject, numerous analyses were made of several parts of the plant, but want of time prevented the examination of all parts in a satisfactory manner. Therefore, in the following report, in order to complete the treatment of this subject, advantage has been taken of the work of previous chemists to a degree which is duly acknowledged.

The Cotton-plant as it stands in the field ripened and ready for picking, may be divided into six (6) parts—the lint, seed, bolls, leaves, stem and roots. An average plant, air-dried, may be assumed to weigh 3.5 oz.* Of this,

The	Lint	will weigh	0.3	oz.
"	Seed	" "	0.6	"
"	Bolls	" "	0.5	"
"	Leaves	" "	0.5	"
"	Stem	" "	1.3	"
"	Roots	" "	0.3	"

In producing an average crop of 150 lbs. lint cotton per acre, there will have been grown on the acre 150 lbs. lint, 300 lbs. seed, 250 lbs. bolls, 250 lbs. leaves, 600 lbs stem, and 150 lbs. roots.

	Organic Matter.	Mineral Matter, or Ash.
The Lint consists of (in 100 parts)	..98.25	1.75
" Seed " " "	..96.59	3.41
" Bolls " " "	..85.24	12.96
" Leaves " " "	..82.74	15.22
" Stem " " "	..95.02	3.98
" Roots " " "	..92.76	5.08

---

*An average obtained by actually weighing a number of plants carefully air-dried; such as would probably produce the assumed crop of 150 lbs. to the acre

The organic matter consists, in all cases, of Oxygen, Hydrogen, Carbon and Nitrogen. The different portions of the plant contain, in 100 parts, the following resprctive amounts of Nitrogen:

The	Lint	contains	0.54
“	Seed	“	1.96
“	Bolls	“	1.03*
“	Leaves	“	2.14*
“	Stem	“	1.16
“	Roots	“	1.17

The Ash of the Lint will contain, in 100 parts,

Phosphoric Acid	10.25
Potash	21.34
Lime	26.74
Magnesia	9.46
Other Mineral Matter	32.21

There will be contained, in 100 parts of the Ash of

	Seed.	Bolls*.	Leaves*.	Stem.	Roots.
Phosphoric Acid	35.76	6.87	7.75	13.68	7.50
Potash	30.25	14.28	14.96	24.06	23.52
Lime	9.87	27.31	28.14	26.36	23.37
Magnesia	12.42	6.14	6.11	9.75	8.23
Sulphuric Acid	6.48	13.25	12.97	5.52	4.12
Oxide of Iron	1.87	5.12	5.60	1.41	6.98
Chlorine	.85	4.11	4.65	6.42	8.01
Soda	2.50	8.84	9.25	6.79	10.64
Silica		14.08	10.57	7.01	8.63

In reviewing these results, we observe that the most important mineral constituents in each and every part of the Cotton plant, are Phosphoric Acid, Potash, Lime and Magnesia. In round numbers, we have in 100 parts of the Ash of each part of the plant, the following amounts of these main constituents:

---

* Analysis made by M. George Ville, as quoted by Prof. Mussa; probably incorrect in the case of the Nitrogen of the leaves. This will be carefully examined here.

In 100 parts of the Ash of

	Lint.	Seed.	Boll.	Leaves.	Stem.	Roots.
Phosphoric Acid	10	36	7	8	14	8
Potash	21	30	14	15	24	24
Lime	27	10	27	28	26	22
Magnesia	10	12	6	6	10	8

Estimated from these percentages and the proportion of Ash before stated as yielded by the several paιts of the plant, we have in 100 parts:

	Lint.	Seed.	Boll.	Leaves.	Stem.	Roots.
Phosphoric Acid	0.18	1.22	.91	1.22	.56	.40
Potash	0.37	1.02	1.82	3.28	.96	1.22
Lime	0.48	.34	3.49	4.25	1.04	1.12
Magnesia	0.17	.41	.77	.92	.40	.41
Nitrogen	0.54	1.96	1.03	2.14	1.16	1.17

As before stated, in producing an average crop of 150 lbs. of Lint Cotton per acre, there will also have been produced 300 lbs. Seed, 250 lbs Bolls, 250 lbs Leaves, 600 lbs. Stems, 150 lbs. Roots.

There will be contained in

	150 lbs Lint.	300 lbs Seed.	250 lbs Bolls.	250 lbs Leaves.	600 lbs Stems.	150 lbs Roots.
Pounds Phosphoric Acid	0.27	3.66	2.26	3.05	3.36	0.60
“ Potash	0.54	3.06	4.52	8.20	5.76	1.83
“ Lime	0.72	1.02	8.82	10.60	6.24	1.68
“ Magnesia	0.24	1.23	1.93	2.30	2.40	0.61
“ Nitrogen	0.81	5.88	5.07	5.35	6.96	1.75

To sum up, therefore, we find that to produce the above stated average crop of Lint Cotton per acre, there would be required, in all—

Phosphoric Acid	13	lbs.
Potash	24	“
Lime	30	“
Magnesia	9	“
Nitrogen	26	“

The Bolls, Leaves, Stem and Roots are usually returned at once to the soil, and with them is returned, in round numbers—

Phosphoric Acid	9 lbs.	Magnesia	7 lbs.
Potash	20 "	Nitrogen	19 "
Lime	27 "		

Of the remainder, there is left at the gin-house, with the Seed—

Phosphoric Acid	4 lbs.	Magnesia	1 lbs.
Potash	3 "	Nitrogen	6 "
Lime	1 "		

Whilst there is entirely removed from the acre, and sent into market with the Lint—

Phosphoric Acid	¼ lb.	Magnesia	¼ lb.
Potash	½ "	Nitrogen	1 "
Lime	¾ "		

REPORT OF L. H. CHARBONNIER,

PROFESSOR OF ENGINEERING.

School of Applied Mathematics.

This School is organized for the benefit of the following classes of Students:

1st. Those who intend to make Engineering a profession.

2d. Those who desire to study Applied Mathematics, to complete a Scientific course.

3d. The students in the regular course in Agriculture.

4th. Such students who, not having the means to complete one of the regular courses, confine themselves to the study of such subjects as they may elect.

There were, during the collegiate year ending August, 1873, thirty-six students in attendance, of whom six graduated.

There are two classes—Junior and Senior. To enter the Junior class, a student must have completed Arithmetic, Algebra, Geometry and Trigonometry, with the usual English branches, Geography, History and Composition.

During the Junior year, the students meet the Professor twice a day. One hour is devoted alternately to Surveying and Descriptive Geometry. On completion of these, Lectures are commenced on "Building Materials and Strength of Materials." The first embrace: Care and Seasoning of Timber: Saw-Mill practice; Description of Limestones, Manufacture of Limes and Cements; Mixing of Concrete, and its applications in Building; Practical information on the Manufacture of Iron, and the Practice of Machine Shops.

The course in Surveying is thoroughly practical. One afternoon of each week is spent in field practice, under charge of the Professor; each student has abundant opportunity to manage and use the instruments by himself, and every operation of Surveying is illustrated by actual work in the field. During the Spring of the year, several days are spent in making Topographical Surveys of some extensive tract of land. The School is supplied with several Compasses, two Transits, two Levels, a Plane Table, Chains, Staffs, &c. The instruments are new. There is still needed a Solar Compass, to make the set complete.

Every day each student is required to draw for at least one hour, and is practiced in making working drawings of buildings and Engineering structures, and in drawing the maps and profiles of his surveys. The applications of Descriptive Geometry make also a part of the course in Drawing.

During the Senior year, the students meet the Professor twice a day. One hour is employed in Lectures and Recitations; the other in Drawing. One afternoon of each week is passed in field practice with the instruments; and the students are drilled in all the operations of Road Surveying, and the works necessary for the drainage of farm lands. The subjects studied are: Strength of Materials; Framing of Roofs and Bridges; Construction of Masonry, Retaining Walls, Piers and Abutments of Bridges; Equilibrium of Stone Arches; Construction and Management of Roads and Hydraulic Engineering, embracing works necessary for Drainage and Irrigation of lands; Improvements of Water Powers; Construction of Water Wheels; Construction and Management of Canals.

The course is not merely theoretical, but is made as praccal as possible by Lectures, illustrated by working drawings of works actually constructed; the application of the theory is constantly enforced by requiring the solution of practical problems, with working drawings, bills of materials and specifications.

The students of the regular course in Agriculture join the students in Engineering in the full course in Surveying and in all the field exercises. In Drawing, their attention is directed to the construction of country houses and improved farm buildings. During the Senior year, practical lectures are given them in: Building Materials; Strength of Materials; Construction of Frame, Stone and Brick Houses; Construction of common Road Bridges; Construction of Roads and Hydraulic Engineering. These lectures embrace but little theory, the object being to give the student as much practical information as possible, of such a kind as will be most useful to him. Recitations are always held on the subject of the Lectures. In Hydraulic Engineering, the attention of these students is specially called to the works necessary for Draining and Irrigating lands, and the operations are carefully described. The improvement of Water Powers, for the purpose of moving machinery on farms is also treated of.

Such has been the work done in this School in the past year.

The students, as a class, have been and are laborious and faithful.

In addition to the course in Civil Engineering, there is also a course marked out for students who wish to become Mechanical Engineers. There was last year no one to complete this course.

Finally, the School is commencing to accumulate a Library of scientific and practical works. It also possesses a few models, but needs many more.

NORTH GEORGIA

AGRICULTURAL COLLEGE.

This College is located in Northern Georgia—at Dahlonega. The excellent building formerly used as a Mint by the United States Government, but recently donated by Congress for educational purposes, is appropriated to the use of this College.

By an agreement of the Trustees, $2,500 of the annual income appropriated to the State College is set apart to aid in the support of this institution thus rendering it a department of the University of Georgia.

The College was organized and opened January, 1873, under Col. D. W. LEWIS, President. No special age nor qualifications are made necessary for admission. *Tuition is free*, but a matriculation and library fee of $10 per year is required of each student. The number of pupils in attendance session ending August, 1873, was 170.

REPORT OF THE TREASURER.

William L. Mitchell, *Treasurer of the University of Georgia in account with the Land Scrip Fund, from May* 1*st*, 1872, *to January* 1*st*, 1874.

1874.		Dr.
January 1.	To interest collected on Land Scrip Fund	$16,034.15
	To cash advanced from general funds of the University, to carry on Georgia State College of Agriculture and Mechanic Arts	2,222.13
		$18,256.28

1874.	*Contra.*	Cr.
January 1.	By cash paid salaries	$13,802.33
	" " " for Chemical Apparatus for Georgia State College of Agriculture and the Mechanic Arts	1,800.00
	By cash paid for Books, Stationery, Printing, Advertising, Experiments and Labor on Farm, Fuel and Incidentals.	2,653.95
		$18,256.28

February 10, 1874. WM. L. MITCHELL, Treas.

Approved:

AND'W A. LIPSCOMB, Chancellor.

SUBSCRIBERS TO THE APPARATUS FUND

For the Georgia State College of Agriculture and the Mechanic Arts.

[To each subscriber of $100 there is given a University bond with two tuition coupons attached, each coupon being receivable for tuition in this College for one year.]

Name.	*Residence.*	*Amount.*
A. A. Lipscomb,	Athens,	$100
W. LeRoy Broun,	"	100
John B. Gordon,	Atlanta,	100
D. A. Vason,	Albany,	100
James Camak,	Athens,	100
R. L. Bloomfield,	Athens,	100
H. C. White,	Athens,	100
Williams Rutherford and C. P. Willcox,	Athens, ($50 each)	100
Charles Morris and L. H. Charbonnier,	Athens, ($50 each)	100
F. A. Lipscomb and F. B. Lucas,	Athens, ($50 each)	100
E. R. Ware and R. M. Smith,	Athens, ($50 each)	100
W. L. Mitchell,	Athens,	100
Lamar Cobb,	Athens,	100
Howell Cobb,	Athens,	100
T. A. Burke,	Athens,	100
R. D. Moore,	Athens,	100
J. S. Hamilton,	Athens,	100
Stevens Thomas,	Athens,	100
Young L. G. Harris,	Athens,	100
Robert Thomas,	Athens,	100
R. L. Moss,	Athens,	100
John W. Nicholson,	Athens,	100
Rev. M. H. Henderson,	Athens,	100
John A. Meeker,	Athens,	100
A. K. Childs,	Athens,	100
B. C. Yancey,	Athens,	100
C. J. Jenkins,	Augusta,	100
John White,	Athens,	100
S. Barnett,	Washington,	100
D. W. Lewis,	Dahlonega,	100
J. S. Newman,	Sparta,	100
George A. Oates,	Augusta,	100
E. A. Carter,	Burke co.,	100
J. A. Hunnicutt,	Athens,	100

FACULTY.

President,
WM. LeROY BROUN, M. A.

WM. LeROY BROUN, M. A.
Professor of Natural Philosophy.

L. H. CHARBONNIER, A. M.
Professor of Engineering and Military Tactics.

WILLIAMS RUTHERFORD, A. M.
Professor of Mathematics.

C. P. WILLCOX, A. M.
Professor of Modern Languages.

H. C. WHITE, C. & M. E.
Professor of Chemistry and Geology.

F. A. LIPSCOMB, A. M.*
Professor of English and English Literature.

E. M. PENDLETON, M. D.
Professor of Agriculture and Horticulture.

CHARLES MORRIS, M. A.†
Acting Professor of History.

EDWARD HUNTER, C. & M. E.
Instructor in Mathematics and Mechanical Drawing.

Capt. JAMES BONHAM,
Instructor in Military Tactics and Mathematics.

C. A. ATKINSON, B. Sc.
Instructor in English.

Penmanship and Book-Keeping are taught, under authority of the Faculty, by Prof. B. B. Euston.

° Deceased.
† Prof. Morris is the Professor of Greek in the University.

Chancellor of the University,

A. A. LIPSCOMB, D. D., LL. D.

TRUSTEES.

C. J. JENKINS	President.
MARK A. COOPER	Vice-President.
W. L. MITCHELL	Secretary and Treasurer.

CHARLES J. JENKINS	*Augusta.*
MARK A. COOPER	*Cartersville.*
W. L. MITCHELL	*Athens.*
*R. D. MOORE	*Athens.*
H. V. M. MILLER	*Atlanta.*
D. W. LEWIS	*Dahlonega.*
B. H. HILL	*Atlanta.*
JOSEPH E. BROWN	*Atlanta.*
ROBERT TOOMBS	*Washington.*
B. C. YANCEY	*Athens.*
D. A. VASON	*Albany.*
JAMES JACKSON	*Macon.*
J. L. SEWARD	*Thomasville.*
GEORGE F. PIERCE	*Sparta.*
M. J. CRAWFORD	*Columbus.*
J. A. BILLUPS	*Madison.*
SAMUEL HALL	*Macon.*
D. C. BARROW	*Woodville.*
STEVENS THOMAS	*Athens.*
J. W. BECKWITH	*Savannah.*
LAMAR COBB	*Athens.*
J. J. GRESHAM	*Macon.*
DUNLAP SCOTT	*Rome.*
W. H. HULL	*Augusta.*
JAMES M. SMITH	*Atlanta.*
JOHN B. GORDON	*Atlanta.*
Y. L. G. HARRIS	*Athens,*
JOHN SCREVEN	*Savannah.*
N. J. HAMMOND	*Atlanta.*
M. P. BARROW	*Maxey's.*
A. O. BACON	*Macon.*
J. C. RUTHERFORD	*Macon.*

---

*Deceased.

C
296uZa C
1891/92

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

ANNUAL REPORT

OF THE

GEORGIA STATE COLLEGE

OF

AGRICULTURE AND THE MECHANIC ARTS,

FOR THE YEAR

1891-92.

ANNUAL REPORT

OF THE

EORGIA STATE COLLEGE

OF

AGRICULTURE AND THE MECHANIC ARTS,

FOR THE YEAR

1891-92.

ATLANTA, GA.:
CONSTITUTION JOB OFFICE.
1892.

"An annual report shall be made regarding the progress of each college, regarding any improvements and experiments made, with their costs and results, and such other matters, including State, industrial and economical statistics, as may be supposed useful; one copy of which shall be transmitted by mail, free, by each, to all other colleges, which may be endowed under the provisions of this Act, and also one copy to the Secretary of the Interior."—(ACT OF CONGRESS OF 1862).

"An annual report by the President of each of said colleges shall be made to the Secretary of Agriculture as well as to the Secretary of the Interior, regarding the condition and progress of each college, including statistical information in relation to its receipts and expenditures, its library, the number of its students and professors, and also as to any improvements and experiments made under the direction of any experiment stations attached to said colleges, with their costs and results, and such other industrial and economical statistics as may be regarded as useful; one copy of which shall be transmitted by mail, free, to all other colleges further endowed under this Act."—(ACT OF CONGRESS OF 1890).

PRESIDENT'S REPORT.

The Honorable, the Board of Trustees of the University of Georgia:

Gentlemen:—I have the honor to submit the Annual Report of the Georgia State College of Agriculture and the Mechanic Arts for the year 1891–2.

As the present year may be said to mark the beginning of a new era in the development of the College, it may not be improper to present a brief historical sketch of the institution from its founding to the present time.

By Act approved July 2d, 1862, the Congress of the United States granted to each State and Territory an amount of public land equal to 30,000 acres for each Senator and Representative in Congress to which it was entitled by apportionment under the census of 1860, as an endowment for the support and maintenance in each State of a College "where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to Agriculture and the Mechanic Arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

Georgia accepted the grant by Act of the General Assembly approved March 10th, 1866, and by a subsequent Act, approved December 12th, 1866, the Governor was authorized "to receive the land and land scrip, to sell the same, to invest the proceeds in bonds of the State, and to disburse the interest of said investment for the support and maintenance of a College such as was contemplated by the Act of Congress, and to provide rules and regulations for the organization, governance and operation of said College until the next ensuing session of the General Assembly."

On January 3d, 1872, the Governor sold the land and land scrip granted to Georgia for the sum of $243,000, which was duly invested in securities of the State bearing 7 per cent. interest.

The question of location, organization and establishment of the College in Georgia was carefully and thoroughly discussed in the legislature and throughout the State. It appeared that the University of Georgia was "the only institution of learning in this State having power by law to organize and establish a College in all respects such as is described in said Act of Congress" (Executive Order, March 30th, 1872). The Board of Trustees of the State University accordingly, in April, 1872, organized and established, within the University, and as a co-ordinate department of the same, a College "distinct in its organization and specific as to its objects, in conformity in every respect with the Act of Congress" to which the name "The Georgia State College of Agriculture and the Mechanic Arts" was given.

The Governor, by Executive Order of March 30th, 1872, accepted the College on behalf of the State and ordered the interest on the land scrip fund paid to the Trustees of the University, to be "inviolably appropriated to the endowment, support and maintenance of the College as organized." Subsequent legislatures approved the act of the Governor by annually directing the payment of interest upon the land scrip fund to be made to the College so established.

The College was opened at Athens as a provisional organization May 1st, 1872, and as a permanent department of the University, September 15th, 1872, under the presidency of Dr. Wm. LeRoy Broun. The University set aside the "Rock College" (a large three-story stone building, one mile from the University campus) and sixty acres of land attached, for use as a college farm, and also gave free use of all its lecture rooms, buildings, dormitories, libraries, apparatus and museums to the new college.

The city of Athens, by popular vote (Feb. 20th, 1873) donated to the college $25,000 for the erection of a new building (the "Moore College") upon the University campus; and friends of the college (mainly citizens of Athens) subscribed $6,000 for equipping it with furniture and apparatus. The vote of the city was ratified by legislative enactment, approved Feb. 10th, 1874.

The Legislature of 1875 appropriated $15,000 for the purchase of "scientific apparatus" for the College.

The new institution entered upon its work with great zeal and enthusiasm. The parent University, through its trustees and officers, gave it every encouragement and assistance possible. Its Faculty, "separate and distinct in organization," was made up in part of the professors filling existing chairs in the University suitable to its needs, and in part of men elected to new chairs made necessary by its peculiar and specific objects. The public discussion of the matter of the establishment of the College had advertised it extensively. During the provisional organization ninety-six students were received into the College proper, and on the opening of the regular term, in Sept. 1872, nearly two hundred applied for admission, of whom one hundred and fifty-one were admitted. Many of the students thus admitted lacked the necessary preparation to qualify them to pursue, advantageously, college courses of instruction. Preparatory schools in the State, especially in the rural districts, were comparatively few and inefficient; the people were poor, and our industries had scarcely been reorganized after the shock and destruction of the Civil War. Moreover, the novel character of the new institution gave rise to a misapprehension (natural, perhaps) on the part of many that such a college could furnish a short cut to the "liberal and practical education of the industrial classes." Forced by the terms of the endowment, and by regard for the true interests of higher education to maintain an institution of genuine college grade, and, at the same time, unwilling to deprive worthy and earnest young men of proper age of any advantage, which they might possibly derive from attendance upon the College, the Faculty, by organizing preparatory classes under their individual instruction, and the Trustees of the University, by appointing competent tutors to assist in elementary work, endeavored to maintain at once the scholarship of the institution, and the greatest possible number of students in attendance.

This conflict between lack of preparation on the part of applicants for admission, and the desire and the duty of the officers of the College to maintain its genuine collegiate character, led to many perplexing difficulties. Notwithstanding the zealous labors of professors and tutors, it was found impracticable to maintain within the College preparatory schools, which should be satisfactory either to the officers or the students. The policy was, therefore, adopted of extending aid to what were known as "branch colleges," located in different sections of the State, with the expectation and hope that these might more economically furnish preparatory education and act as "feeders" to the College.

By contract with the "North Georgia Agricultural College" at Dahlonega, the trustees of the University, Oct. 24th, 1872, agreed to pay that institution $2,000 annually, on certain conditions, from the interest on the land scrip fund.

By act of the Legislature, approved Dec. 16th, 1878, branch "Colleges of Agriculture and the Mechanic Arts," were established at Thomasville and Cuthbert, and the Board of Trustees of the University was authorized to appropriate annually, for the payment of teachers in these colleges, from the interest on the land scrip fund, "such sums as they may think fit, and such other sums from that or any fund as said Board may find it practicable and wise to spare from the support of the North Georgia Agricultural College, and the State College of Agriculture and the Mechanic Arts, located at Athens in this State."

By Acts approved October 17th, 1879, and September 28th, 1881, respectively, similar branch colleges were established at Milledgeville and at Hamilton.

Thus authorized, the Board of Trustees for several years contributed annually to the support of the branch colleges at Thomasville, Cuthbert, and Milledgeville, amounts ranging from $1,000 to $2,000 to each. The total income from the land scrip fund amounted to $16,814.16. Deducting the $2,000 paid Dahlonega, and the $3,000 to $6,000 paid the other branch colleges, the amount left for the support of the College at Athens was totally insufficient for its needs. Its continued existence at all was only possible because of the support given by the University. The University of Georgia, though established, chartered and controlled by the State, receives from the State no appropriation for its support. From private endowment and its own invested funds, it has a moderate fixed income. Previously to the year 1881, it derived its main support from tuition fees, which ranged from $15,000 to $20,000 per annum. Under the organization of the State College proposed by the Board of Trustees and accepted by the Governor, "free tuition in this College is guaranteed to as many students, residents of this State, as there are members of the General Assembly of Georgia, and in addition to this free tuition in the College, all such students are likewise entitled to the advantages of the different departments of the University of Georgia without charge." Although, as a matter of fact, no such distinction was made, or was possible, yet, it was feared by many patrons of the College that some invidious distinction might be made among the body of students of the University between those who paid and those who did not pay tuition. Added to this was the desire of the authorities to conform the University to the general policy of American public institutions of learning to open their doors freely to the youth of the State without charge for tuition. Moreover, as was anticipated, the addition of the State College Department as a free Department, practically made the University a free institution. Accordingly, by Act of the Legislature, approved September, 29, 1881, the Board of Trustees was authorized to offer free tuition to all students of the University. Since the passage of that Act no charge for tuition has been made in any of the academic departments of the University.

Thus deprived of a large part of its usual income, the University was unable to continue its financial aid to its State College Department. Indeed, free tuition in any of the departments was only possible by consolidation and judicious administration of the revenues of all, as the State made no annual appropriation to the University to offset the loss occasioned by surrender of the privilege to charge tuition. The appropriations to the branch colleges (excepting at Dahlonega) were therefore gradually reduced, and finally ceased after June, 1890. By reducing the salaries of the officers, and by other economical adjustments, the Board of Trustees was enabled to thus change the policy of the institution without materially decreasing its teaching force, or otherwise impairing its educational efficiency. At least no change in these particulars was made in the State College. It was clearly foreseen, however, that under then existing conditions, the College would be barely able to hold its own, and would be entirely unable to meet future demands which would probably be made upon it to increase and extend its industrial courses especially. The hope was entertained that the generosity of the State might make provision for these demands as they arose. In one particular only has this hope, as yet, been realized. By Act, approved October 13th, 1885, the Legislature established, as a branch of the State University, a School of Technology, "for the education and training of students in the industrial and mechanical arts," and appropriated $65,000 for the erection of necessary buildings, for equipment and for one year's support. The School was placed under the general control and management of the Board of Trustees of the University, but its immediate management was entrusted to a special Commission appointed by the Governor. This School was located in Atlanta, which city gave, to secure the location, a suitable building site, $70,000, (by official and private subscription), and $2,500 annually for ten years. Since its establishment the State has made annual appropriations for its maintenance. It is an admirable institution, and in its special work of mechanic training has done good service in industrial education.

Some little relief was temporarily given the College at Athens by the passage of the Act of Congress, approved March 2d, 1887, establishing Agricultural Experiment Stations in connection with the Land Scrip Colleges established by Act of 1862, and appropriating $15,000 annually to each of the States for their support. By reason of certain defects in the Act of Congress, no money was available for uses of these stations until after the passage of a subsequent Act in January, 1888. On February 18th, 1888, the Board of Trustees established an Experiment Station as a department of the State College of Agriculture and the Mechanic Arts, in accordance with the terms of the Act of Congress. The Professor of Agriculture in the College was appointed Director of the Station, and his salary paid from the income of the Station. The College farm was arranged and equipped for Station work, certain necessary buildings being added. Several officers for purely Station work were added to the staff of the Director. "Necessary legislation to enable Georgia to receive her share of the first year's annual appropriation not having been completed until June, 1888, nearly the whole amount of the first appropriation was expended for buildings and equipment, a small amount only for salaries." At the annual meeting in June, 1888, the Board of Trustees elected an Entomologist and a Geologist for the Station, these officers to fill also, respectively, the chairs of Biology and Geology in the College, and their salaries were paid in part from the funds of each the Station and the College. The Professor of Chemistry in the College was also appointed Chief Chemist to the Station, and his salary in part paid from Station funds. Other officers for exclusively Station work were also appointed.

The relief thus afforded was, however, short lived. By Act, approved December 29th, 1888, the Legislature established an Agricultural Experiment Station for Georgia, and entrusted its control and management to a special Commission appointed by the Governor. This Commission, in May, 1889, removed the Station from the College and established an independent Station near Griffin, in Spalding county, and assumed control of the funds and management of the Station after July 1st, 1889.

Thus thrown back upon its original limited resources, the College was obliged to vacate and consolidate some of its professorial chairs, and would have been compelled to vacate or consolidate others but for the prospective relief promised by an Act then pending in Congress to increase the endowment of the Land Scrip Colleges. By Act, approved August 30th, 1890, (the "Morrill Act"), Congress appropriated from the proceeds of sale of public lands, the sum of $15,000 annually, (to be increased by $1,000 annually until the appropriation should become $25,000, then to remain annually at that sum), for the further support and maintenance of one College in each State and Territory established under the Act of 1862. Certain legislation on the part of the State, made necessary by the terms of this Act, was not perfected until November, 1890, and by reason of certain arrangements necessary to be made by the State and Federal authorities, the first payment to Georgia was made only in August, 1891. It was not until this date (August, 1891,) that the Board of Trustees felt sufficiently assured of a reasonably permanent income for the College to enable them to establish the present organization upon a permanent basis. At a special meeting, August 13th, 1891, the organization now in operation, as hereafter detailed, was perfected.

The Act of Congress of 1862 made no provision for a possible distinction in race of those who might apply for admission to the Colleges which it established. Co-education of the races was deemed impracticable and impolitic in Georgia. The Legislature recognized as just, however, the claims of the colored race to a fair share of the benefit to be derived from the congressional grant. Accordingly, by Act, approved March 3d, 1874, the State, "in lieu of any claims of the colored population of the State upon the Land Scrip fund," appropriated $8,000 annually to the Atlanta University, an institution for colored people, on condition that it should provide certain appropriate educational facilities and should admit colored pupils free of tuition charges in like numbers as provided for white pupils in the State College at the University. This adjustment, which was, and ever since has been, considered equitable and just by white and colored citizens alike, was continued until July, 1888, when the Legislature ordered the appropriation to be withheld so long as white pupils were admitted to the Atlanta University.

The Act of Congress of 1890 provided that "no distinction of race or color" should be made in the admission of students to the Colleges which it aided, but provided, further, that "the establishment and maintenance of such Colleges separately for white and colored students shall be held to be a compliance with the provisions of this Act, if the funds received in such State or Territory be equitably divided," etc. Accordingly, by Act, approved November 26th, 1890, the Legislature of Georgia established the "Georgia Industrial College for Colored Youths" as a branch of the State University, and under the control and government of the Board of Trustees, providing a special Commission, appointed by the Governor, for its immediate and local management. The $8,000 theretofore paid annually to the Atlanta University, was ordered paid to the new College, and the Governor was instructed to "propose and report to the Secretary of the Interior," as required by the Act of Congress, as a "just and equitable" division of the approriations made by the Act of 1890, that two-thirds be used by the Board of Trustees of the University for the support of the existing college for white students and one-third for the college for colored students; giving the Governor power, however, to change this proportionate division at any time on agreement with the Secretary of Interior. The Secretary of Interior was inclined to hold that a "just and equitable" apportionment required a division between the races in respective proportions of children of school age, but accepted, however, the proposition of the Governor that payment of the entire appropriation be made to the Board of Trustees of the University for use of both its departmental Colleges, under the guarantee of the Board of Trustees that equal facilities for instruction should be provided in each. The College for colored students was established at Savannah, and put into actual operation May 16th, 1891. At the meeting of the Board of Trustees, August 13th, 1891, the appropriations received under the Act of Congress of 1890 for the years 1889–90 and 1890–91 were divided, two-thirds being given to the College for white, and one third to the College for colored students, for use in equipment, etc., in accordance with the terms of the congressional grant. As the College for colored students was not in existence during the years for which these appropriations were made, this division was deemed "just and equitable." Subsequent appropriations, (including that for 1891–92), were ordered to be divided, in accordance with the suggestion of the Secretary of the Interior, 53 per cent. being assigned to the State College of Agriculture and the Mechanic Arts, and 47 per cent. to the Industrial College for Colored Youths, (these being the respective percentages of white and colored children of school age in Georgia as shown by the census of 1890,) this division to be maintained, if necessary to secure equal educational facilities and courses of instruction in the two colleges.

Meanwhile, through all its varying financial fortunes, the College at Athens zealously and faithfully prosecuted its educational work strictly along the lines laid down in its original organization. A college had been established, strictly in accordance with the Act of Congress, to teach, as its "leading object," "such branches of learning as are related to Agriculture and the Mechanic Arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." It had been announced that the education to be provided should be both "liberal" and "practical;" liberal, in the sense that the student should be thoroughly grounded in the elements of learning and broadened by the scholarship of general culture; practical, in the sense that the applications of pure science to industrial pursuits should be studied subsequently to or at the same time with the study of the sciences themselves, in the laboratory, on the farm and in the engineering field. "Empiricism, in any form, however popular," was never to be sanctioned by the teaching of the College. Education, not the mere imparting of information, was to be the object of the College. The connection of the College with the University made immediate and economic provision for the main branches of liberal education, and the chief efforts of the College were directed to building up its practical (in the sense indicated) departments. Laboratories in Physics, Chemistry and Biology were thoroughly equipped, collections of industrial products were made and engineering instruments and models provided. The farm was stocked with all needful appliances to illustrate the processes of practical agriculture. Courses in Agriculture, Agricultural Chemistry, Applied Chemistry (Technology), Analytical Chemistry, Engineering and Applied Mathematics were established and the degrees of Bachelor of Agriculture, Bachelor of Science and Bachelor of Engineering offered in the State College in addition to the former academic degrees of the University. Additional instructors were appointed from time to time, as the income available permitted, to conduct these "practical" courses. Arrangements were made for securing the services of specialists for short courses of instruction in Dairying, Veterinary Science and other subjects related to Agriculture.

The development of the College by the addition of new industrial courses to its curricula, was necessarily seriously impeded by the smallness of its income. From its organization in 1872 until August, 1891, at no time (with the exception of the portion of the year when its authorities administered the Experiment Station fund), was its income greater than $14,814.16, and, by reason of appropriations to the branch colleges, it was generally much less, some years being as small as $10,000. It was only because the University, by charging itself with a large part of the salary account, a good part of the general expense account and all costs of building, repairs and insurance, that the courses originally established were maintained from an entirely insufficient revenue. The policy of extending aid to the branch colleges may have been a mistaken one; it was so considered by many connected with the College, and the expectation that these schools would prove valuable "feeders" to the College was not realized, for the number of students sent up from them into the College courses has been very small; the indications clearly were that it was not a popular policy, for, despite repeated and persistent efforts on the part of many wise and friendly legislators, the Legislature of the State has generally and at last finally (by action of the present Legislature) declined to make appropriations from the State treasury for the support of these institutions; but it was a policy adopted after careful deliberation by a body, embracing a number of the wisest and most patriotic citizens of the State, the Board of Trustees of the University, as one which, under circumstances then existing, promised the greatest usefulness for the College. With a change of policy now accomplished, and with its revenues materially increased, it is reasonable to anticipate that the growth and the improvement of the College from this time forth will be marked and satisfactory.

The numbers of students in attendance upon the College have, in the main, been satisfactory, but have not been as great as the authorities would have desired, or as the College was qualified to care for. The numbers have been as follows:

For the years in which the State College students were classified separately from the students in other departments of the University:

	1871-2	1872-3	1873-4	1874-5	1875-6	1876-7	1877-8	1878-9	1879-80	1880-1
In the College proper....	94	151	132	101	93	61	40	52	62	56

Since the abolition of tuition fees in the University (1881) the numbers of students who have, in whole or in part, attended the courses in the State College have been—

	1881-2	1882-3	1883-4	1884-5	1885-6	1886 7	1887-8	1888-9	1889-90	1890-1
	146	196	203	182	204	206	214	178	194	178

The number in attendance the present session (1891 2) is 185.

Under all the circumstances, the College, from its establishment has done noble service in the higher education of the youth of the industrial classes of the State. That its training has not been shared by greater numbers is due to causes which have affected the attendance upon all collegiate institutions in the State. The deplorable lack of common schools to furnish the elementary education necessarily preparatory to collegiate education, especially in the country districts; the grave inefficiency of many of the existing schools because of shortness of term or lack of means to secure qualified teachers, and the comparative poverty of the people generally, conspired to debar many young men from participation in the advantages which the College offered. These causes, thus operating to prevent the College from reaching the full measure of its usefulness, are, it is hoped, being gradually removed. The present Legislature of Georgia has largely increased the appropriations to the common school fund; the schools are increasing in numbers and have been made more efficient, and their terms been lengthened; it may not be doubted that the material prosperity of the people is rapidly increasing; and these gratifying facts add much of hopefulness to the future work of the College.

The first President of the College, Dr. Wm. L. Broun, (appointed May 1st, 1872) resigned in August, 1875. He was succeeded by Prof. L. H. Charbonnier, who resigned in August, 1878. For economic and other reasons, the Chancellor of the University was then made *ex officio* President of the College. By Acts of the Legislature, approved August 23rd, 1889, and November 4th, 1889, the Board of Trustees of the University was reorganized and reduced in numbers. At the first meeting of the reorganized Board, June 16th, 1890, the "separate and distinct organization" of the College was emphasized by the appointment of the present incumbent to the office of President.

PRESENT ORGANIZATION.

The scope of the instruction now given in the College and the detailed plans by which it seeks to attain its "leading object," "to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life," (Act of Congress of 1862), and to give "instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life," (Act of Congress of 1890), are set forth in the schedule of departments, studies and curricula appended to this report. The College has not departed from the general plan of its original establishment, but has endeavored to extend and improve upon this, especially by providing additional opportunities to study the applications of science to the practical industries. The aim of the College is to provide for its students education that shall be collegiate, not elementary; that shall give a liberal intellectual training which will enable them to take their proper place among the thinking men and scholars of the community; that shall furnish such acquaintance with the true science of history and politics as will enable them, justly and intelligently, to exercise the powers and meet the responsibilities of citizens of a free country; that, at the same time, shall be so directed that they may be, in some measure, prepared, immediately and effectively, for the needs and duties of life in the industrial callings. Such, it is understood, were the purposes for which the College was founded. Liberal training is afforded in the general schools of the College, and is greatly assisted and enlarged by the admission of its students to all the schools of the University. Technical training is furnished in special schools or by the co-ordination of departments into technical courses as follows:

SCHOOL OF PRACTICAL AGRICULTURE:--

This School has been more thoroughly equipped and placed in charge of a Professor of Agriculture, who is not only a qualified teacher, but an experienced farmer as well. The farm has been provided with additional stock and implements, and is now in process of cultivation to bring it to the condition of a model farm in every particular. Courses of instruction in the practices of agriculture are provided for all students in agriculture. Arrangements have been made by which the services for a few weeks of an experienced dairyman may be secured to conduct a dairy school after the most approved methods upon the college farm. It is designed also to secure courses of lectures and instruction from specialists in other branches of agriculture. Provision will be made that all students of the College shall attend a prescribed course of lectures upon general agriculture.

SCHOOL OF CIVIL ENGINEERING:--

This School endeavors to aid students in becoming skillful draftsmen, accurate surveyors, careful designers and practical constructors. The course of instruction is detailed under the proper heading in the appendix.

COURSE IN MINING ENGINEERING:--

A special course of instruction is given in Mining and Metallurgy, including full laboratory work in Assaying. Joined to the instruction of the School of Engineering, this furnishes a very complete course in Mining Engineering.

APPLIED CHEMISTRY:--

Full courses of lectures are given in the School of Chemistry on Industrial Chemistry or Technology—the application of Chemistry to the Industrial Arts, including agriculture; the commercial preparation and treatment of food stuffs, dyeing, calico printing, tanning, building, etc. Opportunity is given in the laboratory for the student to work out for himself the reactions involved and the processes employed.

ANALYTICAL CHEMISTRY:--

The chemical laboratories are large, commodious, and well-equipped with all needful appliances, including gas, water, furnaces, assay plants, balances, apparatus, glass ware and chemicals, and conveniently arranged individual desks. Whilst the main purpose of the schools of Chemistry is to make intelligent, scholarly chemists, and not mere mechanical analysts, yet accurate observation, careful manipulation and intimate acquaintance with analytical methods are recognized as the ground work in the study of the science. Incidentally, therefore, the training is such as to produce skilled analysts, and in the work performed regard is had to the preference of the student and his probable future pursuit. Students in agriculture are occupied especially with the analyses of fertilizers, soils, food stuffs, etc.; in engineering with assaying and mineral analyses; in pharmacy with pharmaceutical products, etc. Those who pursue only a partial laboratory course are trained in general chemical manipulation and methods of analysis. In all the courses, the powers of accurate observation and clear reasoning are developed, and their exercise rigidly insisted upon.

PRACTICAL PHYSICS:--

The Laboratory of the School of Physics is furnished with individual desks for thirty students, and equipped with necessary apparatus and materials for experimental courses in Mechanics, Heat, Light, Sound and Electricity, including construction of apparatus, practice in photography, electrical measurements, etc.

COURSE IN ELECTRICAL ENGINEERING:--

In the School of Physics, under direction of the Professor of Physics and the Instructor in Physics, the foundation has been laid for a thorough course of instruction in electrical engineering. The laboratory is now supplied with a fairly complete equipment of instruments for electrical measurements, dynamos, etc. As additional apparatus (some of which will require a large outlay) is secured, and the necessary room space added to present accommodations, this course will probably grow rapidly in favor and importance.

METEOROLOGY:--

The Moore College building is furnished with a complete set of Draper's self-recording meteorological instruments, and opportunity is afforded students to become familiar with the methods of observation, forecasts, etc., of the National Weather Bureau. The Professor of Physics is a volunteer observer of the United States Weather Service, and complete records, extending back for a number of years, are kept on file.

BIOLOGICAL LABORATORY:--

This Laboratory has tables for twenty-five students, with twenty-five student microscopes and appropriate accessories and materials, together with several larger microscopes for special work. Individual laboratory work is a prominent feature in all the courses in Biology.

LIBRARIES.

The General Library of the University contains about 20,000 volumes. In addition, each of the Schools of the College has a Department Library of carefully selected technical books open to use of the students, embracing in the aggregate nearly 5,000 volumes. Leading periodicals in the several departments are subscribed for regularly, and in some cases valuable complete sets have been secured. Valuable additions to these technical libraries were made from the first appropriation of money received under the congressional grant of 1890. By convenient arrangement of the books and the rooms in which they are kept, students are encouraged to devote unoccupied hours to collateral reading.

MUSEUMS.

The University possesses a good working collection of minerals, rocks and fossils in the Department of Geology, numbering over 4,000 specimens. The Industrial Collections in the Department of Applied Chemistry contain 4,325 articles of crude and finished products, illustrating the applications of chemistry to the industrial arts. The Biological collection now contains nearly 1,000 specimens. This department was organized only in 1888. Additions are made to these collections as opportunities and means permit. Each of the Schools is as well supplied with appropriate maps, charts, diagrams and apparatus as the funds at command have allowed. The equipment of the Schools of Physics and Chemistry is especially complete.

FARMERS' INSTITUTES.

Under the original organization of the College, the Professor of Agriculture was charged "to deliver each year in different parts of the State such popular lectures on agriculture and horticulture as may be found practicable." This duty has been regularly performed either by the Professor of Agriculture or by some other officer of the College, advantage generally being taken of the semi-annual meetings of the State Agricultural Society. These lectures and addresses were instrumental in disseminating much valuable information among the farmers of the State, and were uniformly received with marked appreciation. They were undoubtedly very potent in encouraging scientific practices in agriculture. The educational value of this contact of the officers of the College with the people was so apparent that the Board of Trustees, at the meeting in August, 1891, being in possession of larger means, resolved to enlarge this work of "University Extension" of a technical character among the industrial classes, and so authorized the President of the College to organize and conduct "Farmers' Institutes" during the year at as many points in the State as might be found practicable and convenient. In a circular address issued by the President in November, 1891, Farmers' Institutes were described to be "assemblies of farmers met together to hear lectures and addresses from competent and skilled persons upon topics connected with scientific and economic agriculture; to exchange views and opinions and the results of experience in matters pertaining to the practical culture of the soil and the production of crops, and for the purpose generally of mutual improvement in all matters connected with the profession of farming. The officers of the College of Agriculture hope to bring to these meetings, and to lay before those present in brief, simple addresses the results of their studies and investigations in the branches of pure science related to agriculture, and to encourage the farmers of the State to qualify themselves to pursue their vocation in the light of the full knowledge contributed by the most recent researches in science and economics." During the year such Institutes have been conducted at the following places and dates:

Athens, December 12th; Newnan, February 2d; Griffin, February 4th; Guyton, February 5th; Waycross, February 6th; Thomasville, February 8th; Albany, February 9th; Cuthbert, February 11th; Fort Valley, February 13th; Thomson, March 12th; Cedartown, April 30th; Monroe, May 3d; Holton, May 4th; Talbotton, May 5th; Stinson, (Meriwether county), May 7th. In all, fifteen (15).

The President and the Professor of Agriculture both attended each of these meetings, and for a number of them the attendance was secured of several gentlemen, citizens of the State engaged in agriculture, not connected with the College, but recognized as experts and successful men in various branches of agriculture, who delivered appropriate and valuable addresses.

It is not too much to say that this movement was met on the part of the farmers of the State with enthusiastic commendation and approval. The meetings were generally largely attended, in some instances as many as 500 being in attendance, and the character of the work done and the interest manifested were, in the highest degree, satisfactory. As a result of this general interest, the President has received requests from different parts of the State to hold more Institutes than can possibly be practicable. In order to make the work of the Institutes more permanent, it was proposed to prepare a series of hand-books "for distribution at the times of delivery of the appropriate lectures by the officers of the College, in order that what is then said may be the better remembered, and that the substance of the lectures may be preserved in convenient form for future reference." Accordingly, one such-hand book was published during the present year, a pamphlet of twenty-eight pages on "The Air and the Soil in their Relations to Agriculture," by the President, and 2,000 copies distributed. (The edition printed was inadequate to the demand). Other hand-books are in preparation on "Fertilizers and Manures," "How to Plant Crops," "Stock and Cattle Feeding," and other topics. It is proposed to hold Institutes at other places during the summer vacation. Experience will probably demonstrate that this work may be so systematized that it may not too seriously interfere with the College duties of the officers. There can be no question of its great value, both in educating the people and in commending the College to popular approval.

AGRICULTURAL EXPERIMENT STATION.

Although technically "in connection with" the College of Agriculture and the Mechanic Arts, the Agricultural Experiment Station in this State is located and conducted independently of the College, and is under a distinct and separate management. The "operations, results of experiments," etc., of the Georgia Station, together with the "improvements and experiments made, with their costs and results," etc., are duly set forth in the Annual Report of the Board of Directors of the Station to the Governor, to which report reference is accordingly made. Though practically separated, the College and the Station prosecute their distinct labors in perfect harmony. The Chancellor of the University and the President of the College are members of the Board of Directors of the Station. The bulletins of the Station are valuable aids in the work of the Farmers' Institutes, and the Director and other officers of the Station generously co-operate with the officers of the College on the occasions of the meetings.

With this review of the present condition of the College, it may be safely said that its foundations are wisely laid and its organization such as to carry out legitimately and with satisfactory prospect of success the objects for which it was founded. The connection with the University is not only economic, (which is of immense importance, in view of the very limited income of the College), but is a guarantee of sound scholarship and the maintenance of the College upon a plane of dignity equal to that of any institution of learning in the State. Were the income of the College larger, a number of valuable improvements in its efficiency might readily be suggested. There is need for the addition of several important technical professorships and courses of lectures. New buildings are required for many purposes. In a special report for the current year, I have the honor to suggest to the Board of Trustees certain measures of improvement which may be possible of execution within the means at hand. As there is no present prospect of securing an increase in revenues from any source within the near future, I forbear, at this time, from particularizing as to the most judicious uses to which such increase might be applied.

As it is, the College is doing good, honest, effective work; with larger means it doubtless would do more and better.

The report of the Treasurer of the Corporation for the current year is hereto appended.

Respectfully submitted.

H. C. WHITE, President.

Through the Chancellor of the University.

June 9th, 1892.

UNIVERSITY OF GEORGIA.

Georgia State College of Agriculture and the Mechanic Arts.

FACULTY.

WILLIAM E. BOGGS, D. D., LL. D.,
Chancellor of the University.
H. C. WHITE, B. SC., PH. D.,
President and Professor of Chemistry.
WILLIAMS RUTHERFORD, A. M.,
Emeritus Professor of Mathematics.
L. H. CHARBONNIER, A. M., PH. D.,
Professor of Physics.
C. P. WILLCOX, A. M.,
Professor of Modern Languages.
CHARLES MORRIS, A. M.,
Professor of English.
D. C. BARROW, JR., C. & M. E.,
Professor of Mathematics.
J. P. CAMPBELL, A. B., PH. D.,
Professor of Biology.
C. M. STRAHAN, C. & M. E.,
Professor of Engineering.
J. H. T. MACPHERSON, A. B., PH. D.,
Professor of History and Politics.
J. B. HUNNICUTT, A. M.,
Professor of Agriculture and Horticulture.
C. M. SNELLING, (V. M. I.),
Instructor in Mathematics and Commandant of Cadets.
C. H. HERTY, B. PH., PH. D.,
Instructor in Chemistry.
JESSE COATES, C. E.,
Instructor in Physics.
M. MCH. HULL, B. PH.,
Fellow in Biology.
F. E. CALLAWAY, B. PH.,
Fellow in English.
O. H. SHEFFIELD, B. E.,
Fellow in Engineering.

J. P. CAMPBELL,
Secretary of the Faculty.

TERMS OF ADMISSION.

To be admitted into the State College, the candidate must be not less than sixteen years of age, and must exhibit a correct knowledge of the following subjects: MATHEMATICS—Arithmetic; Olney's Algebra, to Powers and Roots; two books of Geometry; ENGLISH—Spelling and Composition.

The College opens the third Wednesday in September and closes the third Wednesday in June, but students are admitted at any time and assigned to classes for which they may be prepared.

Every student who enters the State College of Agriculture and Mechanic Arts, will be required to take one of the several courses prescribed therein. He may, also, in addition to the studies prescribed in the courses, elect any of the Schools in the University for which he may be prepared, provided that his election does not interfere with the daily schedule of recitations and lectures.

Students who desire to take a special course may elect any studies they prefer, for which they may be qualified, provided they have the requisite number of recitations per week, and provided this election does not interfere with the daily schedule.

The course of study in the State College is not adapted to those students who expect to pursue a Classical course and apply for the degree of Bachelor of Arts, but all the courses and degrees of the University are open to the students of this College.

Systematic courses leading to the degrees of Bachelor of Science, Bachelor of Engineering and Bachelor of Agriculture are offered, together with Post graduate courses leading to the degrees of Civil Engineer and Civil and Mining Engineer.

DEGREES.

The following are the requirements for the regular degrees of the State College:

1. BACHELOR OF SCIENCE—Regular Course.

FRESHMAN CLASS—

MATHEMATICS (six hours per week).—Olney's Complete Algebra; Wentworth's Geometry; Trigonometry—original exercises.

ENGLISH (three hours per week).—Dalgleish's Grammatical Analysis; Abbott's How to Parse; Bain's English Grammar; Kellegg's Rhetoric; Selections from English authors.

HISTORY (three hours per week for the first half session). —General History (Myers) with exercises in Historical Geography.

BOTANY (three hours per week for the last half session).—Structural Botany and Plant Analysis.

PHYSICS (three hours per week for the last half session). Lectures and Laboratory work in elementary Physics.

DRAWING (six hours per week for the first half session). Mechanical and free-hand drawing.

LATIN (three hours per week).—Cicero's Orations; Sallust; Vergil; Roman History; Classical Geography.

OR, in place of LATIN,

DRAWING (six hours per week.)—Advanced course in mechanical and free-hand drawing.

SOPHOMORE CLASS—

MATHEMATICS (six hours per week.)—Olney's University Algebra; Wentworth's Trigonometry; Bowser's Analytic Geometry; Taylor's Calculus.

ENGLISH (three hours per week.)—Angus' Hand-Book of the English Tongue; Kellogg's Rhetoric; Selections from English authors.

HISTORY (three hours per week.)—Gardiner's Students' History of England; Montgomery's France. Class Reports on assigned topics.

PHYSICS (three hours per week for the first half session.)—Lectures and laboratory work in Elementary Physics.

CHEMISTRY (three hours per week for the last half session.)—Lectures and laboratory work in Elementary Chemistry.

And any one of the following:

LATIN (three hours per week).—Ovid; Livy; Cæsar; Grammar; History.

FRENCH (three hours per week).—Whitney's Elementary Grammar; Easy French Reading, with Original Exercises.

GERMAN (three hours per week).—Collar's Eysenbach; Easy German Reading; Joyne's Reader with Imitative Exercises.

JUNIOR CLASS—

MATHEMATICS (three hours per week).—Calculus; Higher Mathematics.

PHYSICS (three hours per week).—Atkinson's Ganot, 12th Edition.

CHEMISTRY (three hours per week).—General Chemistry; Lectures and Laboratory work.

BIOLOGY (three hours per week).—General Biology; Lectures and Laboratory work.

MENTAL PHILOSOPHY (three hours per week).—Porter's Elements, Jevon's Logic;

OR in place of MENTAL PHILOSOPHY:

ENGLISH (three hours per week for the first half session).—Bain's Rhetoric; Whately's Rhetoric; Kellogg's English Literature; Selections from English Authors.

HISTORY (three hours per week for the last half session).—U. S. Constitution and Government; Comparative Politics; Woodrow Wilson's "The State."

And any one of the following:

LATIN (three hours per week).—Horace; Tacitus; Syntax.

FRENCH (three hours per week).—Syntax, with Exercises; A Modern French Play, (Scribe); Moliere's Le Bourgeoise Gentilhomme.

GERMAN (three hours per week).—Reader, continued; Der Neffe als Onkle; Undine; English into German.

SENIOR CLASS—

PHYSICS AND ASTRONOMY (three hours per week).—Atkinson's Ganot; White's Astronomy; Lectures.

CHEMISTRY (three hours per week).—Organic Chemistry; Industrial Chemistry; Agricultural Chemistry; Lectures; Laboratory work.

BIOLOGY (three hours per week).—General Biology; Embryology; Physiology; Histology; Selected Topics; Lectures and Laboratory work.

And any two (equivalent to six hours per week) of the following:

MATHEMATICS (three hours per week).—Calculus; Higher Mathematics.

MECHANICS AND ASTRONOMY (three hours per week).—Peck's Analytical Mechanics; Young's Astronomy.

MENTAL AND MORAL PHILOSOPHY (three hours per week).—Porter's Elements; Lectures.

ENGLISH (three hours per week for the last half session).—Kanes' Elements of Criticism; Kellogg's English Literature; Selections from English and American authors; Lectures.

HISTORY (three hours per week for the first half session.)—Political Economy, Walker; Ely's "Problems of To-day."

And any one of the following:

LATIN (three hours per week).—Seneca; Cicero; Tacitus; Plautus; Terence; Juvenal; History of Literature.

FRENCH (three hours per week).—Prose and Poetry; Racine; Corneille; Moliere; English into French.

GERMAN (three hours per week).—Whitney's Grammar; Schiller; Gœthe; Original Compositions in German.

2. BACHELOR OF SCIENCE—Special Course.

FRESHMAN CLASS—Same as in Regular Course.

SOPHOMORE CLASS—Same as in Regular Course.

JUNIOR CLASS—

Any three of the following:

MATHEMATICS (three hours per week).

PHYSICS (three hours per week).
CHEMISTRY (three hours per week).
BIOLOGY (three hours per week).

And:

ENGLISH (three hours per week for the first half session).
HISTORY (three hours per week for the last half session).

And, in addition:

LABORATORY WORK (twelve hours per week), in the laboratories of Physics, Chemistry and Biology, to be equally divided among the schools selected.

SENIOR CLASS—

Any three of the following:

MATHEMATICS (three hours per week).
PHYSICS AND ASTRONOMY (three hours per week).
CHEMISTRY (three hours per week).
BIOLOGY (three hours per week).

And:

MENTAL PHILOSOPHY (three hours per week).—Junior Class.

And, in addition:

LABORATORY WORK (twelve hours per week), in the laboratories of Physics, Chemistry or Biology, to be divided between at least two of these schools, the time division to be made under the advice and with the consent of the Professors in these schools.

In the division of time to be devoted to laboratory work in the course for this degree, regard will be had to the probable future profession or pursuit of the student.

3. BACHELOR OF ENGINEERING.

FRESHMAN CLASS—

MATHEMATICS (six hours per week).
ENGLISH (three hours per week).
HISTORY (three hours per week for the first half session).
BOTANY (three hours per week for the last half session).
ENGINEERING (two hours per week.)—Elementary Surveying.

DRAWING (five hours per week).—Linear Drawing; India Ink Shading; Projections.

PHYSICS (three hours per week for the last half session).

SOPHOMORE CLASS—

MATHEMATICS (six hours per week).

ENGLISH (three hours per week)

ENGINEERING (two hours per week.)—Descriptive Geometry; Surveying.

DRAWING (five hours per week).—Projections; Shades and Shadows; Model Drawing.

PHYSICS (three hours per week for the first half session).

CHEMISTRY (three hours per week for the last half session).

FRENCH (three hours per week,) OR

GERMAN (three hours per week).

JUNIOR CLASS—

MATHEMATICS (three hours per week).

PHYSICS (three hours per week).

CHEMISTRY (three hours per week).

ENGINEERING (three hours per week).—Searle's Field Engineering; Wheeler's Civil Engineering, begun.

DRAWING (four hours per week).—Perspective Drawing; Topographical Drawing.

LABORATORY WORK (four hours per week) —Mechanics; Determinative Mineralogy; Blowpipe Analysis.

FRENCH (three hours per week), OR

GERMAN (three hours per week).

SENIOR CLASS—

ENGINEERING (five hours per week).—Wheeler's Civil Engineering; Hydraulics; Roofs; Bridges.

DRAWING (four hours per week).—Plans and Specifications for Bridges, Culverts, etc.; Graphical Statics.

MATHEMATICS (three hours per week).

MECHANICS AND ASTRONOMY (three hours per week), OR

ELECTRICAL ENGINEERING (six hours per week).—Lectures and Laboratory work.

4. BACHELOR OF AGRICULTURE.

FIRST YEAR—

MATHEMATICS (six hours per week).—Arithmetic and Book-keeping; Algebra; Geometry; Trigonometry.

ENGLISH (three hours per week).

AGRICULTURE (two hours per week).—Methods of Tillage.

ENGINEERING (two hours per week).—Land Surveying.

DRAWING (three hours per week for the first half session).—Linear Drawing; Plotting.

HISTORY (three hours per week for the first half session.)

BOTANY (three hours per week for the last half session).

PHYSICS (three hours per week for the last half session).

SECOND YEAR—

MATHEMATICS (three hours per week).—Trigonometry; Analytic Geometry.

ENGLISH (three hours per week).

AGRICULTURE (two hours per week).—General Agriculture.

ENGINEERING (two hours per week).—Surveying; Levelling; Drainage; House Construction.

ELEMENTARY PHYSICS (three hours per week for the first half session).

ELEMENTARY CHEMISTRY (three hours per week for the last half session).

PHYSICS (three hours per week).

CHEMISTRY (three hours per week).—General Chemistry; Laboratory work.

THIRD YEAR—

PHYSICS AND ASTRONOMY (three hours per week).—Physics; Astronomy; Meteorology.

CHEMISTRY (three hours per week).—Industrial Chemistry; Agricultural Chemistry.

BIOLOGY (three hours per week).—General Biology; Botany; Physiology; Entomology.

AGRICULTURE (five hours per week.)—General Agriculture; Dairying; Veterinary Surgery; Lectures and practical exercises.

LABORATORY WORK (four hours per week.)—Chemical Laboratory; Analyses of Fertilizers, Soils, Food Stuffs, Etc.

ENGLISH (three hours per week for the first half session).

HISTORY (three hours per week for the last half session). —History; Political Economy.

For courses leading to degree of Bachelor of Arts and other degrees of the University, reference is made to the general catalogue of the University.

POST-GRADUATE DEGREES.

The Post-graduate degrees in this College are professional ones, as follows:

CIVIL ENGINEER.

For the degree of Civil Engineer, the student must complete all the studies required for the degree of Bachelor of Engineering; must graduate in one modern language, and must perform such additional work as the Professors of Physics, Chemistry, Geology, and Engineering direct.

CIVIL AND MINING ENGINEER.

For the degree of Civil and Mining Engineer, in addition to the requirements for the degree of Civil Engineer, the student must perform additional work in Mining and Metallurgy, and in the preparation of original theses.

SCHOOLS OF THE STATE COLLEGE.

MATHEMATICS.

WILLIAMS RUTHERFORD,
EMERITUS *Professor.*

DAVID C. BARROW. Jr.,
Professor.

CHARLES M. SNELLING,
Instructor.

During the Freshman year, the class completes Geometry and the course in Elementary Algebra, and begins Trigonometry. Considerable time is given to original exercises, especially in Geometry. The student is taught, not only to make a sufficient argument, but is required to make it in a concise and systematic form.

During the Sophomore year, Algebra, Trigonometry, and Analytic Geometry are completed, and Calculus is begun. The emphasis on the solution of original problems and exercises is even more stringent in this class.

The Junior Class pursues the study of Calculus, in which great care is taken to have students understand the methods of investigation used. They are taught to separate the principles peculiar to Calculus from the Algebraic operations used in carrying them out. In this way it is hoped they will not only acquire facility in using this mathematical instrument, but also obtain the distinctive culture which this study can give.

A course of reading, under the direction of the Professor, will be given to post-graduate students seeking the degrees of Master of Arts, Master of Science, Civil Engineer, and Civil and Mining Engineer. Written examinations on the work assigned will be given, in the discretion of the professor.

PHYSICS AND ASTRONOMY.

L. H. CHARBONNIER,
Professor.

JESSE COATES,
Instructor.

Undergraduate Course.—There are five classes in this course: Elementary Physics, Junior Physics, Senior Physics, Astronomy and Mechanics.

1. The Class in Elementary Physics meets three times a week, during the last half of the Freshman year, and three times a week during the first half of the Sophomore year.

A completed course in General Physics is given. Instruction is by lectures and recitations, supplemented by regular laboratory work by the student.

2. The Junior Class meets the Professor three times a week, and studies Mechanics of Solids, Liquids and Gases, Acoustics and Heat.

3. The Senior Class in Physics meets the Professor three times a week, until February 1st, and twice a week during the remainder of the session, prosecuting the study of Light Magnetism, Electricity and Meteorology.

The course in Physics is largely experimental, and the relations of principles to practical life are carefully and constantly indicated in familiar or formal lectures. The excellent and complete apparatus with which the department is supplied, enables the Professor to illustrate fully every part of the course, and to present to students the methods pursued in scientific investigations.

4. The class in Astronomy is divided into two sections.

The first consists of the students in the Senior year of the A. B. course, and meets the Professor once a week, from February 1st to the end of the session. This course is general in character, and aims to give the student only such information as should be possessed by any one with a liberal education.

The second section in Astronomy consists of students in the B. S. and B. E. courses, and meets the Professor four times a week, from February 1st to the end of the session.

This course embraces, but in an extended form, the work of the first section; and also introduces the student to the study of Spherical and Practical Astronomy. A knowledge of Spherical Trigonometry and of Calculus is required in this course.

5. The class in Mechanics consists of students in the Senior year of the B. S. and B. E. courses, and meets the Professor three times a week, until the 1st of February. A knowledge of Calculus is required for this course.

PRACTICAL PHYSICS.—In connection with the department, there is established a Laboratory course, in which students perform experimental work, and are exercised in actual Physical manipulations. This course is required of students in the B. S. and B. E. degrees, and in the Post-graduate courses. There are three classes in the course: Junior, Senior and Post-graduate. In the first two, the course embraces the experimental work of Ganot's Physics, and "Worthington's Laboratory Practice" is used as an additional text. The course for Post-graduates is based on "Pickering's Physical Manipulations," which is used as a text-book.

MODERN LANGUAGES AND LITERATURE.

C. P. WILLCOX,
Professor.

There are three classes in French—the Sophomore, Junior and Senior, and a like number in German.

The students of each class meet the Professor three times a week during the session of nine months. For admission to a higher class, the student must have passed successfully through the course of the preceding year, or years, or have made equivalent attainments.

The instruction in the first, or Sophomore year, is largely oral, the main objects being the attainment of an agreeable and fluent pronunciation, a certain familiarity with the most usual forms of expression, and readiness in the use of them. Imitation and repetition, Nature's own method in the acquirement of a living language, is in a large measure the law of the class-room, especially during the first two or three months of the course. The essential points of grammar are also presented, and systematic exercises (written), practically illustrating them, are assigned throughout the year.

With a certain fund of materials thus at ready command, the ear habituated to the sounds of the foreign language, and the tongue schooled to reproduce them, the student is prepared to enter profitably upon the critical and literary course of the two following years. This course is sufficiently indicated by the scheme presented elsewhere.

It is not easy to prescribe, in advance, the exact amount of reading to be accomplished in the entire course, but the aim is to read critically a fair number of the great masterpieces of French and German literature.

In a word, the course of instruction is intended to be extensive and thorough. The effort is made to lay the foundation of accurate and useful scholarship, such as shall enable the student to read the languages fluently, to write them with correctness, to understand and appreciate their literature, and to prosecute his subsequent studies in them with ease and enjoyment.

An independent course in Spanish is offered to those who wish to pursue the study of that language.

CHEMISTRY.

H. C. WHITE,
Professor.

C. H. HERTY,
Instructor.

There are five regular courses in this School.

1. Elementary Chemistry.—The students of the Sophomore Class meet three times a week during the last half of the session. An elementary course in General Chemistry is given, partly by lecture and recitation, but mainly by experimental work in the laboratory by the students.

2. The students of the Junior Class pursue the study of General Chemistry, meeting the Professor three times a week during the session. The subject is presented in the following order:

1. The Non-Metallic elements; their history and combinations with each other.

2. The principles of Chemical Nomenclature, Symbols and Notations; the general principles of Chemical Philosophy.

3. The Metals; their History, Combinations, Salts, etc.

4. Organic Chemistry.

This course is illustrated throughout by appropriate experiments, and the application of special branches of the subject to Medicine, Agriculture and the Arts duly noted.

3. The students of the Senior Class meet the Professor three times a week, and pursue the studies of Organic, Industrial and Agricultural Chemistry.

INDUSTRIAL CHEMISTRY.—In this course, the applications of the facts and principles of Chemistry to the Useful Arts are especially studied, with as much attention to the practical details of each as time will allow.

AGRICULTURAL CHEMISTRY.—The following subjects are presented:

1. The Chemistry of Plants.

2. The Anatomy and Physiology of Plants.

3. The Chemistry of the Atmosphere.

4. The Chemistry of the Soil, and its Physical Properties influencing Agriculture.

5. Means of improving the soil, and influencing the growth of Plants; Farm-yard Manure, Commercial Fertilizers, etc.

The lectures of this course begin about the 1st of February, and are free to the public.

4. MINING AND METALLURGY.—A course of lectures, with recitations upon Mining and Metallurgy, is delivered to a special class formed of students in the regular Scientific course. A laboratory course in Assaying is conducted in connection with these lectures.

Instruction in the several courses of Chemistry is given by lectures, which are illustrated by such specimens, models, and drawings, as the various subjects require. No textbooks are used at present.

The departmental library of the School of Chemistry immediately adjoins the main lecture room, and is well supplied with standard text-books and authorities, complete files and current numbers of chemical journals, etc.

5. ANALYTICAL CHEMISTRY.—A thorough course in Analytical Chemistry is offered to such students as desire to become proficient analysts, or teachers of Chemistry, or to prosecute original research.

A preliminary course of instruction is given in Manipulation, and constant practice is required, that students may familiarize themselves with such portions of the laboratory work as require mechanical skill—glass-blowing, handling and care of apparatus, use of blow-pipe, etc. A course of blow-pipe Analysis is next given; then a thorough course in Qualitative Chemical Analysis is pursued, until the student is competent to determine the chemical constituents of unknown substances presented to him. The remainder of the course is devoted to Quantitative Analysis, Gravimetric and Volumetric—the quantitative determination of the chemical constituents of a substance, the composition of which has been previously determined by Qualitative Analysis.

After pursuing the regular course to the necessary extent, the students will be allowed considerable latitude in the choice of substances for examination, whether of Soils or Fertilizers in connection with the study of Scientific Agriculture—of blood, urine, etc., by the Medical student—of Metals and Ores by those interested in mining, etc.

The courses of Laboratory work constitute an important feature in this department, and are designed to furnish facilities for thorough instruction and practice in all branches of chemical research.

Each laboratory student is given a separate desk, and is required to furnish himself with a set of ordinary apparatus, which costs about $10.00. By making a deposit of that amount with the Professor, a complete set of apparatus will be advanced. At the end of the session, all undamaged pieces will be received back, and the money deposited, less the cost of apparatus actually used up, will be returned to the student. Should he prefer, the student may purchase his apparatus elsewhere. Larger and more expensive pieces of apparatus are kept in the general laboratory stock for use of students.

A fee of fifteen dollars per session is charged each student for the chemicals consumed in his work.

ENGLISH LANGUAGE AND LITERATURE.

CHARLES MORRIS,
Professor.

F. E. CALLAWAY,
Fellow.

Instruction in this department embraces the Freshman, Sophomore, Junior and Senior classes. In the two classes first mentioned, as a preparation for the more advanced classes, a course is given in the Analysis and Synthesis of English sentences, with weekly exercises; and also in the Elements, Sources and History of the English language.

In the Junior and Senior Classes the study of Rhetoric and Criticism is pursued, supplemented in each by selections from classic authors which are studied and commented upon in class, in illustration of the principles studied in text-books, as well as with a view to creating and forming a taste for Classic English Literature.

In addition to the studies of the regular course as stated above, a class in the Anglo-Saxon Language and Literature has been organized for the students of the Junior and Senior classes. This course comprises the study, not only of the Anglo-Saxon, or old English, but is continued through the Middle English Period, thus enabling the student to trace the change and development of our language from its ancient form to its present use; to understand more clearly the idioms and structures of the modern English, and opening to him the hitherto almost sealed book of Anglo-Saxon and Middle English Literature, interesting alike from its scope and variety.

GEOLOGY.

VACANT.*

The class meets the Professor three hours per week during the Senior year. The course of instruction is at first a general one, embracing the study of the distinguishing properties of minerals and common rocks, the decay of rocks, and the formation of soils. Following this is a more extended course in Microscopic Lithology, Palæontology, Structural, Dynamical and Historical Geology.

---

*Temporarily in charge of the President.

BIOLOGY.

J. P. CAMPBELL,
Professor.

M. McH. HULL,
Fellow.

The study of Biology begins in the Freshman year with a course in Botany, consisting of three weekly exercises, beginning February 1st. After a preliminary study of plants, the student begins Determinative Botany and prepares a small herbarium.

In the General Biology course, beginning with the Junior year, special emphasis is laid upon the laboratory work. The aim is to cultivate habits of self-reliance and independence of thought, and to this end the student receives abundant practice in the scientific methods of observation, experiment and reasoning. The subject matter upon which this training is based, is a series of familiar plants and animals, illustrating all the more important divisions. No attempt is made to cover the entire fields of Zoology and Botany, but the student is supplied with specimens, and then placed as far as possible in the attitude of an original discoverer. The lectures are designed not so much to impart information to be verified in the laboratory, as to suggest lines for independent investigation. As each type is mastered, it is made the basis of a description of the class which it represents, considered from the standpoint of function and development, as well as structure. The course in General Biology is concluded about the middle of the Senior year, after which the time is devoted to Histology, Embryology, and general questions of a theoretical nature. The practical side of Biology is kept well forward in all courses, the student being required to study objects rather than books.

The work of Post-graduate students varies from year to year, and may be altered to suit the special needs of students. For the coming year, courses are offered in Embryology, special topics in Physiology, and the Histology of the sense organs.

A fee of five dollars is charged each student taking a laboratory course. Students are also required to provide themselves with dissecting instruments, hand lenses, and drawing materials.

Opportunities for extra work are freely offered to any students who may have the time and inclination to undertake it.

Students in the School of Agriculture follow the general course in Biology. There is, in addition, in the first year of the Agricultural course, a course in Economic Botany, in which the student receives training in the methods of plant analysis, and in the study of injurious fungi. In the second year a course is given in Economic Entomology, in which the anatomy, histology, life-histories, and classification of insects are considered, special emphasis being laid on those forms injurious to cultivated plants, and attention being given to the remedies for the same.

ENGINEERING.

C. MORTON STRAHAN,
Professor.

O. H. SHEFFIELD
Fellow.

The regular course in Engineering covers four years, beginning in the Freshman year.

As will be seen by reference to the requirements for degrees, ample time is allowed in the schedule for students in this school.

The department endeavors to aid students in becoming skillful draftsmen, accurate surveyors, careful designers, and practical constructors.

The instruction in Drawing extends through the four years of the regular course. It covers mathematical projections, shades and shadows, perspective drawings from models, including India ink and water color shadings, topographical and map drawings and designs for various engineering and building structures, showing plans, elevations and details.

The course in surveying embraces the work covered by Van Amringe's edition of Davies' Surveying and Johnson's Theory and Practice of Surveying, supplemented by ample field practice. The course is then extended in the direction of railroad engineering; Searle's Field Engineering being followed as the text.

The department is provided with a camping outfit in addition to a complete equipment of instruments. During the spring of each year the Professor and the members of the three higher classes go into camp and spend considerable time in locating a railroad. The corps is organized strictly, and its members go through all the actual work of reconnoissance, preliminary and location surveys. They make up the proper drawings and estimates for the routes surveyed, and design trestles and bridges for water-course crossings.

When the subject of surveying is finished, a course of study embracing those principles common to all branches of the profession, (Wheeler's text on Civil Engineering being used as a basis), is first completed, after which much time is given to special study of roofs, bridges and hydraulics.

For the degrees of Civil Engineer and Civil and Mining Engineer, the Professor directs the reading of the applicant, having in view the branch of the profession he intends to pursue.

Every facility is offered to students who wish to make a specialty of this school and become competent engineers. To such students, upon successful completion of the studies followed, will be awarded formal certificates covering the work accomplished.

HISTORY AND POLITICAL SCIENCE.

J. H. T. McPHERSON,
Professor.

The work of this department is required in all classes of the regular courses. The ground covered by each class varies in different years. During the current year, the Freshmen devoted three hours a week to the study of Greek and Roman History, with Oman's Greece and Allen's Rome as texts. The Sophomore class completed a thorough course in the history and institutions of England, based upon the text of S. R. Gardiner. The Juniors studied the history of the United States and American Politics. Special emphasis was laid upon the analysis and interpretation of the Constitution, and disputed passages were illustrated by the opinions of Kent, Marshall, Story, Cooley and Miller. The Convention of 1787, the Northwest Territory Ordinances, the growth of political parties, and similar topics, were made the subjects of private investigation, with reports and discussion in class. The texts used were Alexander Johnston's and Stephens' Histories, and Johnston's American Politics. The Senior class took up the study of Political Economy with Walker as text, supplemented by Mill and Ely. Principles were constantly illustrated by application to the economic history of the United States, and individual investigation was made a feature of the course. A number of excellent papers were produced upon such topics as the Tariff, the National Banking System, Bi-Metallism, the National Debt, Monopolies, Socialism, etc.

The work projected for the coming year will be found under the announcement for degrees. The general object of the course is to give the lower classmen a broad knowledge of history and institutions, and to make a more thorough study of limited fields in the upper classes. Authorities are made readily accessible to students in the historical library, and all efforts are directed towards stimulating thought and encouraging independent reading.

Opportunities for Post-graduate work are provided as desired.

AGRICULTURE.

J. B. HUNNICUTT,
Professor.

This school is designed for the sons of farmers, or other young men who purpose to make farming their leading occupation. In other words, it is, as far as practicable, strictly a professional school While principles which underlie the art of agriculture are taught as fully as circumstances permit or justify, special emphasis is laid on the application of those principles.

There are three classes in this school. Students in the first class are taught the principles and practices of general agriculture; the preparation and care of land; the selection and planting of seed; the harvesting and housing of crops; and the proper, economic disposition of farm products for home consumption and for market.

This instruction is continued and amplified during the second year, special attention being paid to the proper diversifying of crops; to the husbandry of small crops, vegetables and fruits; and to the judicious selection and use of farm implements, stock and cattle.

The course during the third year is an extensive one, embracing general agriculture, special studies of special crops, scientific experimenting in agriculture, the preparation of manures, composts and fertilizers, the scientific principles of stock feeding, dairying and care of dairy products; treatment of diseases of plants and animals, etc., etc.

The College farm is conducted as a model farm; being arranged in the manner and conducted according to the methods which are considered best suited to the peculiar conditions prevailing in Georgia and best calculated to make the pursuit of farming in this State remunerative, and to promise to those who adopt it both profit and contentment. It is designed that the students in agriculture shall take actual, individual part in all the operations of the farm, and so become familiar with the best methods and the most economic practices of practical agriculture. The aim of this school is to teach young men that farming in Georgia, properly conducted, can be made a profitable and attractive pursuit, calling for the exercise of intellectual effort as well as of manual labor, and worthy to stand upon a plane of equal dignity and attractiveness with the learned professions.

Students will be encouraged to undertake the individual care of sections of land or of special crops, and opportunities will be afforded them to prosecute, personally, experiments and investigations. Whenever practicable, they will be aided in this work by proper payment for services rendered in the work of the farm.

MILITARY TACTICS.

Lieut. Col. CHARLES M. SNELLING,
Commandant.

In accordance with the provisions of the Land Scrip Fund, military exercises are regularly held in this College, upon which attendance is compulsory, except when a student is excused by the Faculty on the ground of physical disability. These exercises are held three times per week, and consist of squad, company and battalion drill.

The uniform consists of a coat of standard cadet gray cloth, Georgia buttons, trousers of same material, with black stripe one inch wide, and blue cloth cap. This uniform cost about $19.75.

The fatigue uniform is a sack coat of dark blue broadcloth, with black silk trimmings, and Georgia buttons. Vest of same material, cut with straight collar, buttoning high, and smaller Georgia buttons. Fatigue uniform costs about $10.85.

All the students, unless exempted by the Faculty, are required to take part in the drill.

Certain courses in the State College also provide for instruction in the University School of

METAPHYSICS AND ETHICS.

THE CHANCELLOR.

The instruction in this Department consists of a course of two years, beginning with the Junior Class, and embracing Mental Philosophy, Logic and Moral Philosophy.

The Junior Class meets the Professor twice each week. The group of kindred studies will be introduced by Porter's

"Elements of Intellectual Science" to Part IV., at which point Jevons' Logic may be profitably taken up, as the expansion of Dr. Porter's discussion of the processes involved in Reasoning.

The Senior Class meets the Professor three times each week. Completing the more difficult part of Mental Philosophy by the study of "The Intuitions," (Porter's "Elements," Pt. IV.), the Class may readily enter upon the study of select portions of Porter's "Elements of Moral Philosophy."

An advanced course for post-graduates will be provided under the supervision of the instructor.

Instruction in Declamation and Oratory is, temporarily, in charge of the Chancellor. Instruction in voice culture, expression, etc., is given, and regular weekly exercises required of all classes in the College.

EQUIPMENT OF THE DEPARTMENTS AT ATHENS.

CAMPUS.—The University grounds are located in the heart of the city of Athens, and cover an area of thirty-seven acres. They furnish sites for the College Chapel, the Library building, the Moore College, the Ivy building, the halls of the Demosthenian and Phi-Kappa Literary Societies, the new College building, the Gymnasium and Y. M. C. A. building, the Dormitory, the Chancellor's residence, and the houses occupied by several of the Professors. In addition, they contain the parade ground of the University battalion and the ball grounds of the Athletic Association, which have recently been greatly improved.

THE LIBRARY BUILDING.—This is a large three-story brick building, 100x50 feet, situated at the main entrance of the campus The first floor is occupied by the Chancellor's office and two large lecture rooms now in use by the Professors of Mathematics and Metaphysics. The entire second floor is devoted to the University Library. This room is handsomely furnished and conveniently arranged. The Library contains more than 20,000 volumes of general, classical and scientific literature, to which yearly additions are made. A complete list of the current periodicals, both on general and technical subjects, is taken. Special libraries, containing all standard reference books, are in the rooms of the several departments. The Library is in charge of a competent officer, and is free of access to all students of the University from 9 a. m. to 5 p. m., every day except Sunday. Books are taken out under the usual restrictions, and the periodicals are spread on the Library tables for use during Library hours. On the walls of the Library is hung a fine collection of portraits of distinguished Georgians who have been prominently identified with the history and government of the University since its foundation. The third story contains the lecture room and office of the Professors of History and Geology, and the Geological Museum. The Museum consists of a large collection of minerals and a smaller one of fossils.

THE NEW COLLEGE BUILDING is a three-story structure, 100x40 feet, and affords spacious and well-lighted class rooms and offices for the Professors of Ancient and Modern Languages, English and Biology. It contains also the department library of Ancient Languages and the Biological Laboratories and Museum.

Four rooms are devoted to Biology. Two of these furnish desk accommodations to twenty-five students pursuing the class work of the Junior and Senior years. The equipment of these rooms is ample, consisting of twenty-five Leitz microscopes, with powers ranging from 60 to 600 diameters, and one large Zeiss microscope, supplied with apochromatic lenses of the highest powers. Besides these are several dissecting microscopes, and in addition, microtomes, imbedding bath, culture oven, and all other apparatus needed in Histology and Bacteriology.

A third room is equipped as a Physiological laboratory, and will accommodate five students. This room contains a good stock of recording apparatus, chronographs, manometers and other instruments of precision needed in general physiological work, besides numerous appliances needed in the study of cardiac physiology, and the physiology of muscle and nerve. This laboratory is mainly used by post-graduate students, but is open to all, preference being given to prospective medical students.

The Museum contains a relatively small number of specimens, but there is no useless material. It contains a general alcoholic collection of invertebrates, numbering about 500 specimens, and illustrating every class sufficiently to give the student clear ideas of its nature and extent. There are also numerous vertebrate specimens, but not so many as desirable. Numerous mounted skeletons, including domestic animals, are available for study, and there are further models in papier mache of many of the organs of the body. Collections of the local flora and fauna (especially insects) are in progress.

THE MOORE COLLEGE was the gift of the city of Athens to the University. It is 100x50 feet, and has three stories and a basement. The first floor and basement are occupied by the Department of Chemistry, and contain the lecture room, laboratories, industrial museum, balance rooms, assay room, and the private office and laboratory of the Professor. The chemical laboratories are well adapted for elementary work, and all branches of chemical analysis. They furnish desk accommodations for sixty-five students; are supplied with water and gas, and have a complete outfit of balances, furnaces, and all the smaller apparatus and appliances necessary to a complete equipment. The Industrial Museum is a collection of more than four thousand specimens, obtained in this country and in Europe, to illustrate the lectures on Agricultural Chemistry, and Chemistry as applied to the Arts and Manufactures. It is systematically arranged and of the highest value in teaching.

The second floor is devoted to the Department of Physics, containing the lecture room, laboratory, work shop and apparatus room. The lecture room is specially well-arranged for experiments, which necessarily occupy a prominent place in the course of instruction. The apparatus room is filled with a very complete and costly assortment of apparatus, embracing the most recent experimental devices in Acoustics, Optics, Heat, Magnetism and Electricity. A full set of Draper's self-recording meteorological instruments is a part of the outfit of this department. The Physical laboratory will accommodate thirty students, and is in possession of all the appliances suited to the courses there given.

The third floor is occupied by the Department of Engineering, and comprises the lecture rooms, model rooms, and drawing hall of that department. The model rooms are already stocked with models illustrating all branches of engineering work. The models of roofs, bridges, water wheels, railway switches, and timber joints, are of special merit. Two complete sets of surveying instruments (Gurley's make), a fine solar compass, and a large Riehle's machine, for testing the strength of building materials, are available for the use of students in this department. The drawing halls are two in number, and together accommodate sixty students.

During the past year, the instrumental equipment of this department has been largely increased by the purchase of a fine transit with stadia hairs and Saegmuller's solar attachment, a superior alidade with telescope for use with plane table, and a large number of smaller instruments.

THE DORMITORY occupies a central position on the campus, and affords comfortable rooms for forty students. It has been recently put in excellent condition for occupancy. The University exacts no rent for the rooms, in consideration of which all tenants are required to give a pledge to observe good order and protect the property. The administration by the Faculty has been confided to a committee of the "Old College Club," to whom applications for rooms must be made through the Chancellor's office.

The Club supply their own furniture, bedding, etc., and obtain boarding in the city at rates varying from $10.00 to $14.00 per month.

THE CHAPEL, as recently remodeled, will seat about 800 people. In it is a large oil painting of the interior of St. Peter's, Rome, which is one of the most valuable art possessions of the University. In the chapel all the public exercises are held, excepting morning prayers and Sunday afternoon lectures, which, for the sake of convenience, take place in the Chancellor's recitation room.

The University Farm, situated about one mile from the chapel, contains sixty-five acres, with a large three-story building, known as the Rock College. This farm is in charge of the Professor of Agriculture, to be conducted in the interest of scientific farming, and for the benefit of agricultural students connected with the College of Agriculture and Mechanic Arts.

EXPENSE.

Tuition is Free, and the students of the College are admitted to all the Schools and classes of the University. The only fees to which such students are subject, are as follows:

Matriculation fee, payable at the opening of each session	$10 00
Library fee	5 00
Military uniform	19 75

Students pursuing courses which require Laboratory work are charged special fees sufficient to cover materials consumed.

Board and lodging may be obtained at rates ranging from $13.50 to $20.00 per month. Washing, fuel and lights, per session, may be estimated at $30.00.

DISCIPLINE.

In matters of discipline, the students of the State College are governed by the same rules and regulations prescribed for other students of the University.

TRUSTEES OF THE UNIVERSITY OF GEORGIA.

1891-92

His Excellency, GOVERNOR W. J. NORTHEN, Atlanta,
Ex-officio.

W. H. FELTON, Cartersville,
From the State at Large. Term Expires, Sept. 1st, '99.

N. J. HAMMOND, Atlanta,
From the State at Large. Term Expires, Sept. 1st, '93.

H. D. McDANIEL, Monroe,
From the State at Large. Term Expires, Sept. 1st, '95.

A. R. LAWTON, Savannah,
From the State at Large. Term Expires, Sept. 1st, '97.

JOHN SCREVEN, Savannah,
1st Congressional district. Term Expires, Sept. 1st, '97.

A. T. McINTYRE, Thomasville,
2nd Congressional district. Term Expires, Sept. 1st, '97.

B. P. HOLLIS, Americus,
3rd Congressional district. Term Expires, Sept. 1st, '97.

W. A. LITTLE, Columbus,
4th Congressional district. Term Expires, Sept. 1st, '95.

H. V. M. MILLER, Atlanta,
5th Congressional district. Term Expires, Sept. 1st, '95.

A. O. BACON, Macon,
6th Congressional district. Term Expires, Sept. 1st, '93.

D. B. HAMILTON, Rome,
7th Congressional district. Term Expires, Sept. 1st. '93.

J. A. BILLUPS, Madison,
8th Congressional district. Term Expires, Sept. 1st, '95.

N. L. HUTCHINS, Lawrenceville.
9th Congressional district. Term Expires, Sept. 1st, '99.

J. B. CUMMING, Augusta,
10th Congressional district. Term Expires, Sept. 1st, '99.

S. R. ATKINSON, Brunswick,
11th Congressional district. Term Expires, Sept. 1st, '99.

A. L. HULL, Athens, Sect'y & Treas.
Resident Trustee. Term Expires, Sept. 1st, '99.

A. J. COBB, Athens,
Resident Trustee. Term Expires, Sept. 1st, '93.

N. E. HARRIS, Macon, Ex-officio.
President of Technological Board.

W. Y. ATKINSON, Newnan, Ex-officio.
President Board of Commissioners Girls' Industrial College.

P. W. MELDRIM, Savannah, Ex-officio.
President Board of Commissioners Colored Industrial College.

26uZac
10

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

BULLETIN OF THE UNIVERSITY OF GEORGIA
Issued Monthly by the University

Vol. X. NOVEMBER, 1909 No. 3.

The State College of Agriculture

GEORGIA STATE COLLEGE OF AGRICULTURE

The Cotton School And Short Course For Stockmen

JANUARY 3rd to 14th, INCLUSIVE, 1910.

Entered at the Post Office at Athens, Ga., as Second-Class Matter,
August 30th, 1905, under Act of Congress of July 16th, 1904.

SERIAL NUMBER 112

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Georgia State College of Agriculture

Administrative and Technical Staff

ANDREW M. SOULE	President.
JOHN R. FAIN	Professor of Agronomy.
ALFRED AKERMAN	Professor of Forestry.
MILTON P. JARNAGIN	Professor of Animal Husbandry.
R. J. H. DeLOACH	Professor of Cotton Industry.
A. G. G. RICHARDSON	Professor of Veterinary Science.
T. H. McHATTON	Adjunct Professor of Horticulture.
LEROY C. HART	Adjunct Professor of Farm Mechanics.
W. A. WORSHAM, JR.,	Adjunct Professor of Agricultural Chemistry.
P. O. VANATTER	Supt. of Field Demonstrations.
A. P. WINSTON	Foreman of College Farm.
ETHEL REESE	Secretary to the President.
ELLEN JONES	Mailing Clerk and Stenographer.

DEPARTMENT OF AGRICULTURAL EXTENSION.

JONES E. HITE	Director of Extension Work.
THOMAS A. EARLY (In Coöperation U. S. D. A.)	Schools.
ROBERT L. NIXON	Farmers' Institutes.
A. MACLAREN	Dairy Husbandry.
S. A. MINEAR	Horticulture.
— — ———	Clerk and Stenographer.

SPECIAL INSTRUCTORS IN THE COTTON SCHOOL.

J. M. READE	Prof. of Botany, University of Georgia.
E. L. WORSHAM	State Entomologist.
B. A. CRANE	Expert in Cotton Grading.

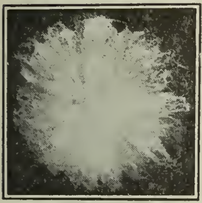
THE McGREGOR CO., ATHENS, GA.

THE COTTON SCHOOL
AND
SHORT COURSE FOR STOCKMEN

Third Session, January 3rd to 14th, 1910

Tuition Free. No Entrance Examination
A Practical Course for Georgia Farmers

INTRODUCTION.



THE third session of the Cotton School will open on January 3, 1910, and continue for a period of ten days. *In one sense the term Cotton School is a misnomer, as the subjects of soils, fertilizers, feeding stuffs and farm machinery all constitute a part of the instruction offered.* The course offered in fertilizers of itself is one of the most important and useful to the farmer since it gives him definite information concerning the origin of fertilizing materials, the methods of mixing them most advantageously, the kind and amount to use on the various crops and soils, and the most economic manner in which he can purchase commercial plant food.

SESSIONS HELD IN AGRICULTURAL HALL.

The sessions of the school will be held in the new Agricultural Hall which is admirably lighted and heated and equipped with special laboratories and class rooms. It is an ideal place to spend ten days in reviewing and ascertaining new facts of vital importance to farmers. *The best testimony that this course is an efficient one is shown by the hearty endorsement of the work on the part of those who have attended in the past.*

INSTRUCTION BY STAFF OF EXPERTS.

The College of Agriculture will on January first have a staff of eighteen experts giving the instruction outlined for the Cotton School, and those attending will have the privilege of conferring with these men and acquiring such information outside of the regular instruction as their time will permit.

SPECIAL LABORATORY FACILITIES.

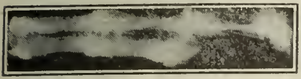
The laboratory equipment of the College has been materially enlarged during the past year, and much of the work which could not be given in a satisfactory manner previously for lack of this equipment will be presented this year in an unusually attractive form.

Georgia farmers on an excursion to the College.

DATA FROM THE DEMONSTRATION FIELD.

The work of the Department of Cotton Industry has been enlarged and strengthened, while the data accumulating in the demonstration field from tests of both cotton and corn will furnish the basis for much valuable instruction to students attending the Cotton School.

FIBER TESTING LABORATORY.



The facilities for fiber testing have been materially improved during the year, so that research work in this important field is now in progress. The laboratory is provided with apparatus for testing and studying the fibers of cotton, and students are urged to bring samples for examination. The loss from defective fiber is enormous, and yet it can be virtually eliminated in the course of a few years by the intelligent breeding of cotton. The work in this laboratory will prove highly beneficial to all those attending the Cotton School.

COTTON CULTIVATION AND BREEDING.

Two features which will be especialy emphasized in the present session of the Cotton School are the cultivation and selection of seed cotton. The yields ordinarily secured may be increased by one-third through better methods of cultivation. Instruction in this subject will be given by an expert of established reputation. You cannot afford to miss the opportunity which these lectures will provide. The control and eradication of such diseases as anthracnose and cotton wilt are dependent largely on seed selection. The value of the lint of cotton may be increased from one to two cents a pound through following certain methods of selection which can be successfully adopted by any farmer. Can you afford to miss securing information of such a vital character?

WORK IN GRADING AND SCORING COTTON.

Practice in cotton grading will be given every afternoon during the progress of the school. This work is so arranged as to give a man a working knowledge of the grades of cotton, and is intended primarily to give the practical farmer a sufficient amount of information on this important subject to enable him to sell his cotton to advantage.

SPECIAL COURSES MAY BE ARRANGED.

The work in the Cotton School may be continued for longer than ten days, if desirable, and an efficient course in cotton grading can be arranged for on the part of those who desire to spend a period of 30 to 60 days with us. The practice work in cotton grading as given in the ten days school, is not intended to make expert graders, but to furnish the farmer with the essential information he should have concerning the handling and preparation of his fiber for sale.

COURSE OF INSTRUCTION.

The course of instruction provided in the Cotton School is as follows:

Ten Lectures on Soils. The type soils of Georgia will be studied from the standpoint of origin, physical and chemical properties, present condition and needs. A special study will be made of the physical properties, the water supply and movement, cultivation, and the use of green and stable manure.

Prof. Fain.

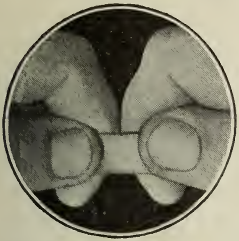
Studying Georgia soils in the laboratory.

Ten Lectures on Fertilizers. A careful study will be made of the effect of various mineral elements in the soil on plant growth; the best means of supplying the elements in which the soil is most likely to be deficient; the sources of nitrogen, phosphoric acid and potash, and methods of purchasing, mixing and applying these various constituents to the soil for the purpose of producing maximum crops. Liming soils, crop rotations and their relation to maintaining the plant food supply will be discussed.

President Soule.

Five Lectures on the Cotton Plant. These will include the history of the cotton plant, conditions most favorable for its growth, and how these can be brought about in the soil; classification of cotton according to varieties; varieties of cotton as affected by soil environment; the study of individual plants and methods of selection for improving the crop; results of experimental tests and demonstrations on the yield and economic value of the leading varieties of cotton grown throughout the South.

Prof. DeLoach.



Five Lectures on Cotton Cultivation. These lectures will include the preparation of land; the best methods of applying fertilizers; when to apply same; details of preparation immediately before planting; how and when the cultivation of young plants should be begun, and the kinds of implements best suited to these purposes. These lectures are prepared to meet the need for better methods of cultivating cotton. It is believed that much shortage of crop and ineffective work are brought about by our ordinary methods of cultivation.

Prof. DeLoach.

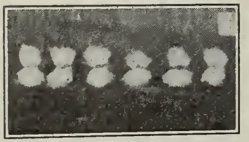
Farmers examining some of the thousands of hybrid cotton plants in the demonstration field.

Five Lectures on Cotton Diseases. The principal diseases affecting the cotton plant, the causes so far as known, and the best methods of combatting and eradicating the same will be discussed in detail. Anthracnose, for instance, is making serious inroads in southern cotton fields, and yet it is a disease practically unknown to the majority of our farmers. It is high time that something was done to check not only this, but the ravages of various other diseases, and this very desirable end can only be attained through a working knowledge of these various diseases.

Prof. Reade.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

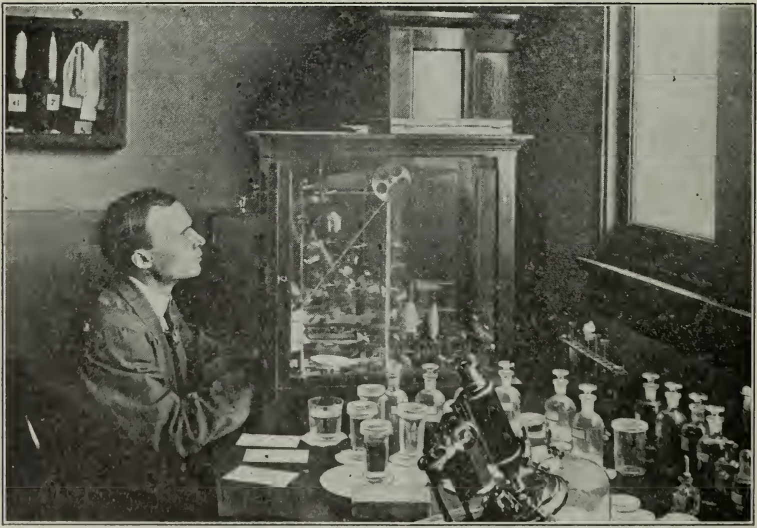
Five Lectures on Cotton Insects. There are various insect enemies of cotton, some of which are seriously reducing the yields obtained in the south. In these lectures, the history, characteristics, and the best method of controlling the depredations of the various insects attacking the cotton plant will be discussed. Prof. Worsham.



Five Lectures on Feeding Cotton By-Products. The high feeding value of cotton by-products is now generally recognized, but unfortunately only a small proportion of what is produced in the south is utilized for feeding beef and dairy cattle at the present time. A large number of experiments have demonstrated the feasibility of feeding these by-products at a good profit in every section of the south, and as soil fertility can best be maintained through the development of animal industries, this subject will be carefully considered.

President Soule.

Five Lectures on Cotton Machinery. Owing to the scarcity and high price of labor, every means which will reduce the cost of production must now be employed by the cotton planter. Therefore, the different forms of plows, cultivators and seeders which may be utilized so as to economize labor and increase the efficiency of soil cultivation will be considered, and as far as possible, the various implements discussed will be exhibited before the class. Prof. Hart.



Examining cotton fibers in the fiber testing laboratory.

Cotton Grading. In this course the student will have an opportunity to handle and grade samples of cotton each day. Each student will record his classification on a printed card, and on the conclusion of the examination of the various samples, the instructor in charge will compare the various samples with the standards used by the class and will give the reasons for grading each sample so the student can see wherein he has made a mistake and can thus profit by the knowledge obtained.

Mr. Crane.

Three Lectures on Marketing Cotton. This discussion will include the necessity for care in picking cotton so as not to gather trash and diseased bolls; the weighing, sampling, practical handling, management and grading of the cotton until it is finally disposed of will be discussed in detail. The organization of cotton warehouses with suggestions for the necessity of such institutions, at least till we learn a better way of handling the crop will receive special attention. Prof. DeLoach.

The foregoing set of lectures covers in a very practical manner the various subjects of instruction offered in the Cotton School. The lectures will all be summarized and presented in mimeographed form to the students at the beginning of each lecture. When the school is over each pupil will have about fifty lecture sheets constituting a ready reference book on cotton and kindred subjects which it would be impossible to buy as there is no similar book in existence. Over eighty hours of instruction are provided for, and those attending will find their time most fully and profitably occupied, and will be well remunerated for the small outlay of money necessitated to take this course.

SPECIAL LECTURES AT NIGHT.

A lecture will be given each night, commencing at eight o'clock. These lectures will be of special interest and benefit to the students in the Cotton School.

The following gentlemen have agreed to deliver addresses:

Chancellor D. C. Barrow—Waste on the Farm.
President Andrew M. Soule—The Regeneration of Southern Agriculture.
Commissioner T. G. Hudson—The State and the Farmer.
Hon. R. F. Duckworth—The Farmer's Interest in Coöperation.
Hon. D. G. Hughes—Business Management on the Farm.
Dr. A. G. G. Richardson—Eradication of the Cattle Tick.
Prof. J. E. Hite—The Extension Movement in Agriculture.
Prof. W. A. Worsham—The Farmer's Interest in Chemistry.
Prof. Thomas A. Early—School Demonstrations.
Prof. S. A. Minear—The Farmer's Garden.

SCHEDULE OF RECITATIONS.

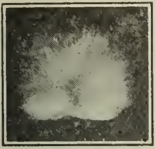
From the schedule of recitations it will be observed that January 3rd is set down as registration day. Lectures will begin Tuesday morning, January 4th, and the course will close Friday night, January 14th, which will enable the students to reach home before Sunday.

SCHEDULE OF RECITATIONS FOR THE COTTON SCHOOL

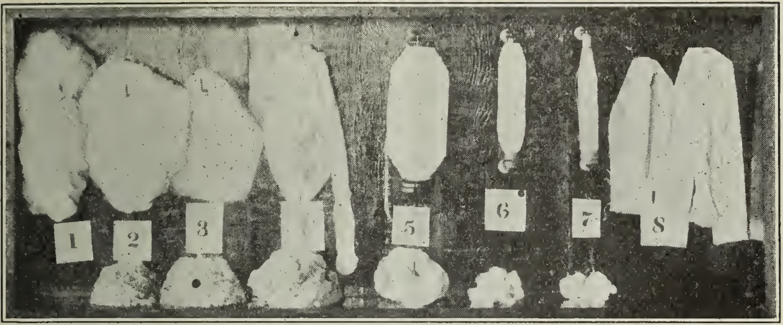
JANUARY 3rd TO 14th INCLUSIVE, 1910

Period	Mon. Jan. 3	Tuesday Jan. 4.	Wednesd'y Jan. 5	Thursday Jan. 6	Friday Jan. 7	Saturday Jan. 8	Monday Jan. 10	Tuesday Jan. 11	Wednesday Jan. 12	Thursday Jan. 13	Friday Jan. 14
9.00 to 9:55	REGISTRATION DAY	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton
9:55 to 10:10		CHAPEL EXERCISES									
10:10 to 11:05		The Cotton Plant	The Cotton Plant	The Cotton Plant	The Cotton Plant	The Cotton Plant	Feeding Cotton By-products	Feeding Cotton By-products	Feeding Cotton By-products	Feeding Cotton By-products	Feeding Cotton By-products
11:05 to 12:00		Cultivation of Cotton	Cultivation of Cotton	Cultivation of Cotton	Cultivation of Cotton	Cultivation of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton
12:00 to 12:55		The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia
12:55 to 1:50		Diseases of Cotton	Diseases of Cotton	Diseases of Cotton	Diseases of Cotton	Diseases of Cotton	Farm Machinery	Farm Machinery	Farm Machinery	Farm Machinery	Farm Machinery
1:50 to 3;10		DINNER HOUR									
3:10 to 5:00		Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton

ADMISSION.



Everybody over sixteen years of age who can read and write will be admitted to the Cotton School. This course has been arranged to meet the most pressing needs of the farmers and is primarily intended to benefit those who have had some years of experience in the actual cultivation of the soil. It is not a course for boys, but for men who desire to increase their store of information concerning agriculture. The majority of those attending in the past have ranged in age from twenty-five to fifty years. The school is organized along strictly business lines. You will not make a mistake in patronizing it, or have a better opportunity of coming in contact with a body of serious minded and representative citizens.



Illustrating the waste in cotton. Eleven bales enter the mills and ten come out. This loss may be eliminated through cotton breeding.

COST OF THE COURSE.

A registration fee of $1.00 is charged for admission to the Cotton School; otherwise the course is free, including a complete set of the lecture sheets prepared by the various professors. The cost to the students attending the Cotton School in view of the low railroad rates now existing will vary from $15.00 to $25.00 since board may be obtained in Athens from 75 cents to $1.00 per day. *This means that practically a free course of instruction in the technique of cotton production and general farming methods is offered to the farmers of Georgia by the State College of Agriculture.*

WHY FARMERS SHOULD ATTEND THE COTTON SCHOOL.

The boll weevil will reach the state within a period of five or six years, and it becomes imperative for the farmers of Georgia to understand the principls of plant breeding and selection, more about crop rotation, fertilizers, and how to handle and utilize lint cotton to the best advantage. The Cotton School affords these opportunities at a minimum of cost to every citizen of the state.

SHORT COURSE FOR STOCKMEN

INTRODUCTION.

Georgia farmers have between forty and fifty million dollars invested in live stock. Between seven and nine million dollars are spent every year for the purchase of mules which could be raised at home at a cost of $40.00 to $60.00 per head until they are old enough to do sufficient work to earn their own food. The cattle tick is responsible for a loss of between three and five million dollars annually to the state. Hog cholera, lung worms and other parasites destroy enormous numbers of hogs. Milk fever in cows and indigestion in horses and mules swell the total by several million more. At least one-tenth of the cotton crop is put into renewing live stock industries which should be developed within the borders of the state.

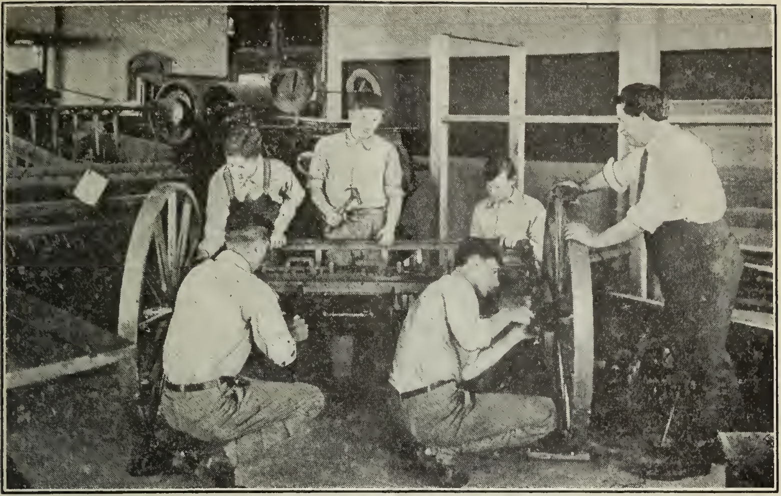
The facts presented are not offered in the nature of criticism, but to show the vital necessity of providing for information that will stimulate stock breeding and production, and insure the animals on our farms being cared for in a manner which will prolong their usefulness, protect them from disease and materially reduce the cost of maintenance.

This being the situation, a ten-days course for stockmen has been organized by the College. The terms of admission, cost of taking the course, place and hours of recitation will be the same as for the Cotton School. The instruction will be given by specialists.

EQUIPMENT.

Instruction in dairying is provided for in laboratories which occupy about 7,000 feet of floor space. Work will be given in the operation of separators and other dairy machinery, and in the handling and manufacture of milk and butter. Special emphasis will be laid on testing milk for fat and solids by the Babcock test and other recognized methods. The preparation of milk for market will be a feature of the course.

Such work in the construction of farm buildings, silos, gates and fences as is likely to be of interest to farmers will be provided for in the farm mechanics laboratory.



Practical instruction in farm mechanics.

The College farm comprising 830 acres will offer many useful lessons to students in this department, since the cropping systems employed furnish many illustrations of the value of crop rotations as well as demonstrating the great variety of crops which may be grown for the maintenance of considerable numbers of live stock on every farm in Georgia.

There are several barns on the College farm. The dairy barn 40 x 70 feet, contains storage space for rough forage and connects with a 130 ton silo. There are also bull houses, blacksmith shop, machine shed and other necessary out-buildings. Thus the farmer interested in the feeding and management of beef or dairy cattle, horses, mules and hogs, may secure the most practical training in this course.

THE COLLEGE HERDS.

There are herds of pure bred Jerseys and Holsteins and grade dairy cattle; representatives of the Tamworth and Berkshire breeds of hogs, and an efficient lot of work stock. This will enable all students attending to receive instruction in preparing rations for all the classes of animals found on the average farm, and in acquiring practical experience in the judging and handling of live stock. Records of the dairy herd have been kept which show that the business can be conducted at a good profit in Georgia. It will thus be seen that the facilities for practical instruction in stock farming are very good indeed.

OUTLINE OF COURSE OF INSTRUCTION.

The course of instruction will be as follows:

Feeds and Feeding, 20 hours: This course will review the sources of feeding stuffs available for the maintenance of live stock, special emphasis being laid on the value of cotton seed and its by-products, and all other materials produced in the state which can be utilized to good advantage in animal nutrition. The gross anatomy and physiology of the digestive organs, and the preparing and compounding of balanced rations for maintenance, milk and butter production, and for fattening and growth will be given consideration. A part of the time will be devoted to the practical preparation of rations in the dairy barn. A person taking this course should be able on its completion to prepare in the most economical manner practical rations for all classes of farm live stock.

Profs. Hite and Maclaren.

Hygiene and Sanitation, 10 hours: This will include a consideration of the principal diseases affecting live stock, practical work in diagnosing the same, and the preparation and administration of curative medicines. Animal sanitation will be considered in all its phases. A review of the various parasites infesting animals and methods of controlling the same will constitute a feature of the course. This will be one of the most practical and helpful courses offered by the College since the losses from malnutrition and improper treatment of farm live stock in Georgia amount to millions in the aggregate every year. Every farmer should avail himself of the opportunity to secure the much needed information provided in this course.

Dr. Richardson.

Breeds and Breeding, 10 hours: In this course the origin, history and development of the various breeds of horses, cattle, sheep and swine adapted to Georgia will be considered. Methods of introducing improved animals will be discussed, and attention will be given to the subject of animal breeding which will include a consideration of selection, heredity and the other fundamental laws concerned in animal reproduction. Special emphasis will be laid on the organization of breeders' association and the improvement of grade animals through the use of pure-bred sires. Prof. Jarnagin.

Farm Management and Cropping Systems, 10 hours: This course will include methods of systematizing the work of the farm and a consideration of the various crop rotations which must be employed in order to provide an adequate supply of food for the maintenance of various classes of farm stock. The subject of choosing a farm, platting and mapping the same, the character and cost of the buildings required will be features of this course. There is a woful lack of business management on our farms at the present time, and this course is designed to point out how these errors in practice may be avoided and the farm so organized and conducted as to insure the lands becoming increasingly fertile. Profs. Fain and Hite.

Studying the principles of corn breeding from material obtained in the demonstration field.

AFTERNOON WORK.

From three to five o'clock every afternoon will be devoted to practical work in the judging and handling of the various breeds of live stock, examining horses for soundness, diagnosing and treating various diseases affecting live stock, examining farm buildings, and studying the sanitary handling of milk and its by-products. A more practical and useful series of demonstrations could not be offered to the farmers than these will afford.

WORK IN DAIRYING.

Should there be some who desire to specialize in dairying certain of the above lectures may be omitted and others substituted, while the time in the afternoons can be given exclusively to the manipulation of separators and the handling of dairy equipment, including instruction in testing milk.

OTHER COURSES MAY BE TAKEN.

It should not be overlooked by those who are not interested in cotton growing or stock farming that the College of Agriculture is prepared to offer ten days and three months courses of instruction of a most practical nature in agriculture, soils, horticulture, farm mechanics, forestry, and veterinary medicine.

Those desiring further information should write to

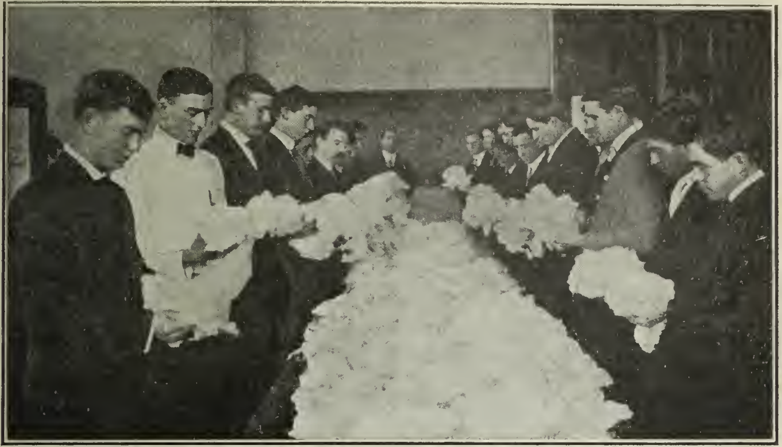
ANDREW M. SOULE, President,
State College of Agriculture,
Athens, Ga.

Zac

BULLETIN OF THE UNIVERSITY OF GEORGIA
Issued Monthly by the University

Vol. XI. NOVEMBER, 1910 No. 3.

The State College of Agriculture



The Cotton School
and
Short Course For Stockmen

JANUARY 2nd to 13th, INCLUSIVE, 1911

Entered at the Post Office at Athens, Ga., as Second-Class Matter, August 30th, 1905, under Act of Congress of July 16th, 1904.

SERIAL NUMBER 134

Georgia State College of Agriculture

Administrative and Technical Staff

ANDREW M. SOULE	President.
JOHN R. FAIN	Professor of Agronomy.
ALFRED AKERMAN	Professor of Forestry.
MILTON P. JARNAGIN	Professor of Animal Husbandry.
R. J. H. DeLOACH	Professor of Cotton Industry.
W. M. BURSON	Professor of Veterinary Science.
T. H. McHATTON	Adjunct Professor of Horticulture.
LEROY C. HART	Adjunct Professor of Farm Mechanics.
W. A. WORSHAM, JR.,	Adj. Professor of Agricultural Chemistry.
P. O. VANATTER	Supt. of Field Demonstrations.
A. P. WINSTON	Foreman of College Farm.
ETHEL REESE	Secretary to the President.
ELLEN JONES	Mailing Clerk and Stenographer.

DEPARTMENT OF AGRICULTURAL EXTENSION.

JONAS E. HITE	Director of Extension Work.
J. PHIL. CAMPBELL (In Coöperation U. S. D. A.)	Schools.
— — ———	Farmers' Institutes.
— — ———	Dairy Husbandry.
— — ———	Horticulture.
MABEL KEITH	Clerk and Stenographer.

SPECIAL INSTRUCTORS IN THE COTTON SCHOOL.

J. M. READE	Prof. of Botany, University of Georgia.
E. L. WORSHAM	State Entomologist.
B. A. CRANE	Expert in Cotton Grading.

THE McGREGOR COMPANY, ATHENS, GA.

THE COTTON SCHOOL

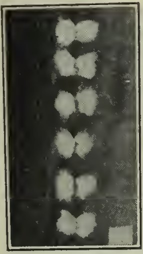
AND

SHORT COURSE FOR STOCKMEN

Third Session, January 2nd to 13th, 1911

Tuition Free. No Entrance Examination
A Practical Course for Georgia Farmers

INTRODUCTION.



THE fourth session of the Cotton School and Farmers' and Stockmen's Short Course will open on January 2, 1911, and continue for a period of ten days.

The sessions of the school will be held in the Agricultural Hall which is admirably lighted and heated and equipped with many special laboratories and class rooms.

The College of Agriculture has a staff of eighteen experts, and those attending will have the privilege of conferring with these men and acquiring such information outside of the regular instruction as their time will permit.

The data accumulating in the demonstration field from tests of both cotton and corn will furnish the basis for much valuable instruction to students attending the Cotton School.

The fiber testing laboratory is provided with apparatus for testing and studying the fibers of cotton, and students are urged to bring samples for examination. The loss from defective fiber is enormous, and yet it can be virtually eliminated in the course of a few years by the intelligent breeding of cotton.

COURSE OF INSTRUCTION.

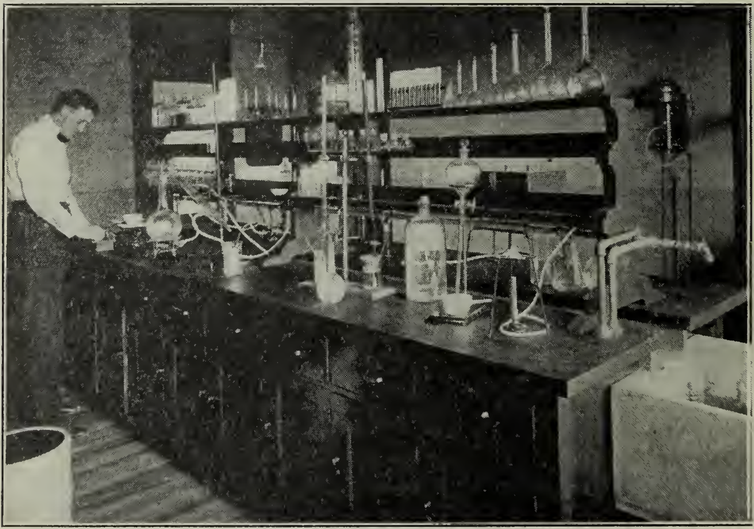
The course of instruction provided in the Cotton School is as follows:

Ten Lectures on Soils. The type soils of Georgia will be studied from the standpoint of origin, physical and chemical properties, present condition and needs. A special study will be made of the physical properties, the water supply and movement, cultivation, and the use of green and stable manure.

Professor Fain.

Ten Lectures on Fertilizers. A careful study will be made of the effect of various mineral elements in the soil on plant growth; the best means of supplying those in which the soil is most likely to be deficient; the sources of nitrogen, phosphoric acid and potash, and methods of purchasing, mixing and applying these various constituents to the soil for the purpose of producing maximum crops. Liming soils, crop rotations and their relation to maintaining the plant food supply will be discussed. President Soule.

Five Lectures on the Cotton Plant. These will include the history of the cotton plant, conditions most favorable for its growth, and how these can be brought about in the soil; classification of cotton according to varieties; varieties of cotton as affected by soil environment; the study of individual plants and methods of selection for improving the crop; results of experimental tests and demonstrations on the yield and economic value of the leading varieties of cotton grown throughout the South. Professor DeLoach.



Laboratory of Agricultural Chemistry Where Soil Problems are Being Investigated

Five Lectures on Cotton Cultivation. These lectures will include the preparation of land; the best methods of applying fertilizers; when to apply same; details of preparation immediately before planting; how and when the cultivation of young plants should be begun, and the kinds of implements best suited to these purposes.

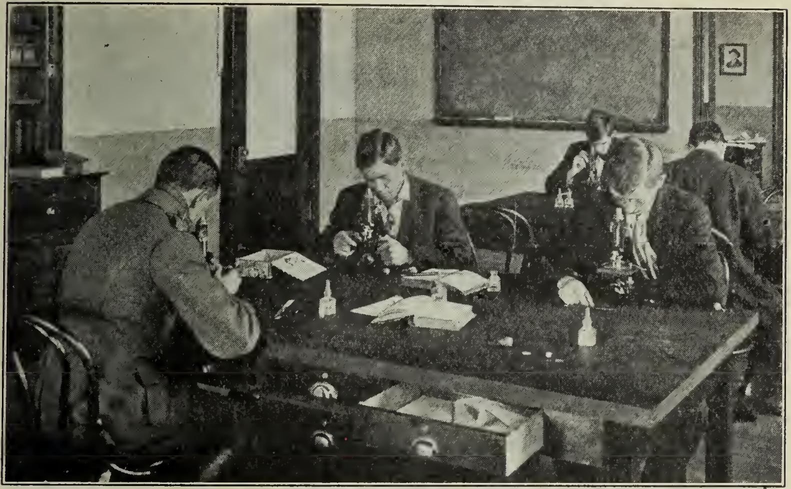
Professor DeLoach.

Five Lectures on Cotton Diseases. The principal diseases affecting the cotton plant, the causes so far as known, and the best methods of combatting and eradicating the same will be discussed in detail. Anthracnose, for instance, is making serious inroads in southern cotton fields, and yet it is a disease practically unknown to the majority of our farmers. It is high time that something was done to check not only this, but the ravages of various other diseases.

Professor Reade.

Five Lectures on Cotton Insects. There are various insect enemies of cotton, some of which are seriously reducing the yields obtained in the south. In these lectures, the history, characteristics, and the best method of controlling the depredations of the various insects attacking the cotton plant will be discussed.

Professor Worsham.



A Study of the Cotton Fiber Will Materially Increase the Wealth of the State.

Five Lectures on Feeding Cotton By-Products. The high feeding value of cotton by-products is now generally recognized, but unfortunately only a small proportion of what is produced in the south is utilized for feeding beef and dairy cattle at the present time. A large number of experiments have demonstrated the feasibility of feeding these by-products at a good profit in every section of the south, and as soil fertility can best be maintained through the development of animal industries, this subject will be carefully considered. President Soule.

Five Lectures on Cotton Machinery. Owing to the scarcity and high price of labor, every means which will reduce the cost of production must now be employed by the cotton planter. Therefore, the different forms of plows, cultivators and seeders which may be utilized so as to economize labor and increase the efficiency of soil cultivation will be considered, and as far as possible, the various implements discussed will be exhibited before the class.

Professor Hart.

Cotton Grading. In this course the student will have an opportunity to handle and grade samples of cotton each day. Each student will record his classification on a printed card, and on the conclusion of the examination of the various samples, the instructor in charge will compare the various samples with the standards used by the class and will give the reasons for grading each sample so the student can see wherein he has made a mistake and can thus profit by the knowledge obtained. Mr. Crane.

View of the Cotton and Corn Breeding Plats.

Three Lectures on Marketing Cotton. This discussion will include the necessity for care in picking cotton so as not to gather trash and diseased bolls; the weighing, sampling, practical handling, management and grading of the cotton until it is finally disposed of will be discussed in detail. The organization of cotton warehouses with suggestions for the necessity of such institutions, at least till we learn a better way of handling the crop will receive special attention. Professor DeLoach.

The foregoing set of lectures covers in a very practical manner the various subjects of instruction offered in the Cotton School. The lectures will all be summarized and presented in mimeograph form to the students at the beginning of each lecture. When the school is over each pupil will have about fifty lecture sheets constituting a ready reference book on cotton and kindred subjects which it would be impossible to buy as there is no similar book in existence. Over eighty hours of instruction are provided for, and those attending will find their time most fully and profitably occupied, and will be well remunerated for the small outlay of money necessitated to take this course.

SCHEDULE OF RECITATIONS FOR THE COTTON SCHOOL

JANUARY 2nd TO 13th INCLUSIVE, 1911

Period	Mon. Jan. 2	Tuesday Jan. 3.	Wednesd'y Jan. 4	Thursday Jan. 5	Friday Jan. 6	Saturday Jan. 7	Monday Jan. 9	Tuesday Jan. 10	Wednesday Jan. 11	Thursday Jan. 12	Friday Jan. 13
9.00 to 9:55	REGISTRATION DAY.	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton	Fertilizers for Cotton
9:55 to 10:10		CHAPEL EXERCISES.									
10:10 to 11:05		The Cotton Plant	The Cotton Plant	The Cotton Plant	The Cotton Plant	The Cotton Plant	Feeding Cotton By-products	Feeding Cotton By-products	Feeding Cotton By-products	Feeding Cotton By-products	Feeding Cotton By-products
11:05 to 12:00		Cultivation of Cotton	Cultivation of Cotton	Cultivation of Cotton	Cultivation of Cotton	Cultivation of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton	Insect Enemies of Cotton
12:00 to 12:55		The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia	The Soils of Georgia
12:55 to 1:50		Diseases of Cotton	Diseases of Cotton	Diseases of Cotton	Diseases of Cotton	Diseases of Cotton	Farm Machinery	Farm Machinery	Farm Machinery	Farm Machinery	Farm Machinery
1:50 to 3;10		DINNER HOUR.									
3:10 to 5:00		Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton	Grading and Scoring Cotton

SPECIAL LECTURES AT NIGHT.

A lecture will be given each night, commencing at eight o'clock.

Chancellor D. C. Barrow—What the Land Offers.
Dr. W. D. Hunter—The Boll Weevil.
Hon. E. Cabaniss—Education from the Farmer's View Point.
Hon. Chas. R. Pendleton—Progress in Agriculture and the Press.
Hon. A. O. Blalock—The Future of Cotton Seed.
Hon. W. L. Peel—Plant Food and Prosperity.
Prof. J. P. Campbell—What the Boy Can Do.

SCHEDULE OF RECITATIONS.

From the schedule of recitations it will be observed that January 2nd is set down as registration day. Lectures will begin Tuesday morning, January 3rd, and the course will close Friday night, January 13th, which will enable the students to reach home before Sunday.

ADMISSION.

Everybody over sixteen years of age who can read and write will be admitted to the Cotton School. This course has been arranged to meet the most pressing needs of the farmers and is primarily intended to benefit those who have had some years of experience in the actual cultivation of the soil. It is not a course for boys, but for men who desire to increase their store of information concerning agriculture. The majority of those attending in the past have ranged in age from twenty-five to fifty years.

A Section of Demonstration Field.

COST OF THE COURSE.

A registration fee of $1.00 is charged for admission to the Cotton School; otherwise the course is free. The cost to the students attending the Cotton School in view of the low railroad rates now existing will vary from $15.00 to $25.00 since board may be obtained in Athens from 75 cents to $1.00 per day.

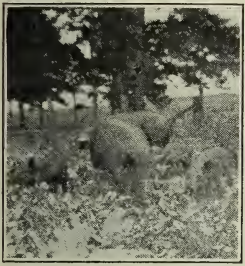
WHY FARMERS SHOULD ATTEND THE COTTON SCHOOL.

The boll weevil will reach the state within a period of three years, and it becomes imperative for the farmers of Georgia to understand the principles of plant breeding and selection, more about crop rotation, fertilizers, and how to handle and utilize lint cotton to the best advantage. The Cotton School affords these opportunities at a minimum of cost to every citizen of the state.

Short Course for Stockmen.

INTRODUCTION.

Georgia farmers have between forty and fifty million dollars invested in live stock. Between seven and nine million dollars are spent every year for the purchase of mules which could be raised at home at a cost of $40.00 to $60.00 per head until they are old enough to do sufficient work to earn their own food. The cattle tick is responsible for a loss of between three and five million dollars annually to the state. Hog cholera, lung worms and other parasites destroy enormous numbers of hogs. Milk fever in cows and indigestion in horses and mules swell the total by several million more. At least one-tenth of the cotton crop is put into renewing live stock industries which should be developed within the borders of the state.



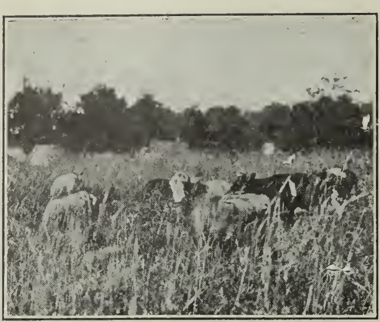
This being the situation, a ten-days course for stockmen has been organized at the College. The terms of admission, cost of taking the course, place and hours of recitation will be the same as for the Cotton School. The instruction will be given by specialists.

EQUIPMENT.

Instruction in dairying is provided for in laboratories which occupy about 7,000 feet of floor space. Work will be offered in the operation of separators and other dairy machinery, and in the handling and manufacture of milk and butter, and in testing milk for fat and solids by the Babcock test.

Such work in the construction of farm buildings, silos, gates and fences as is likely to be of interest to farmers will be provided for in the farm mechanics laboratory.

The College farm comprising 730 acres will offer many useful lessons to students in this department, since the cropping systems



employed furnish many illustrations of the value of crop rotations as well as demonstrating the great variety of crops which may be grown for the maintenance of considerable numbers of live stock on every farm in Georgia.

There are several barns on the College farm and other buildings. The dairy barn 40 x 70 feet, contains storage space for rough forage and connects with a 130-ton silo. There are also bull houses, blacksmith shop, a machine shed and other necessary out-buildings.

THE COLLEGE HERDS.

There are herds of pure bred Jerseys and Holsteins and grade dairy cattle, a herd of Hereford cattle, representatives of the Tamworth and Berkshire breeds of hogs, and an efficient lot of work stock. This will enable all students attending to receive instruction in preparing rations for all the classes of animals found on the average farm, and in acquiring practical experience in the judging and handling of live stock.

OUTLINE OF COURSE OF INSTRUCTION.

The course of instruction will be as follows:

Feeds and Feeding, 20 hours: This course will review the sources of feeding stuffs available for the maintenance of live stock, special emphasis being laid on the value of cotton seed and its by-products, and all other materials produced in the state which can be utilized to good advantage in animal nutrition. The gross anatomy and

Work Stock on College Farm.

physiology of the digestive organs, and the preparing and compounding of balanced rations for maintenance, milk and butter production, and for fattening and growth will be given consideration.

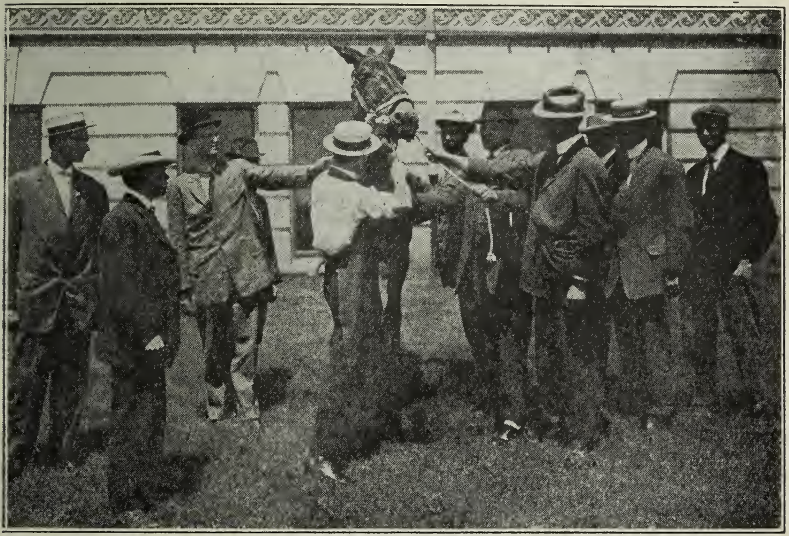
Professor Hite.

Hygiene and Sanitation, 10 hours: This will include a consideration of the principal diseases affecting live stock, practical work in diagnosing the same, and the preparation and administration of curative medicines. Animal sanitation will be considered in all its phases. A review of the various parasites infesting animals and methods of controlling the same will constitute a feature of the course.

Dr. Burson.

Breeds and Breeding, 10 hours: In this course the origin, history and development of the various breeds of horses, cattle, sheep and swine adapted to Georgia will be considered. Methods of introducing improved animals will be discussed, and attention will be given to the subject of animal breeding which will include a consideration of selection, heredity and the other fundamental laws concerned in animal reproduction.

Professor Jarnagin.



A Veterinary Clinic.

Farm Management and Cropping Systems, 10 hours: This course will include methods of systematizing the work of the farm and a consideration of the various crop rotations which must be employed in order to provide an adequate supply of food for the maintenance of various classes of farm stock. The subject of choosing a farm, platting and mapping the same, the character and cost of the buildings required will be features of this course.

Professors Fain and Hite.

AFTERNOON WORK.

From three to five o'clock every afternoon will be devoted to practical work in the judging and handling of the several breeds of live stock, examining horses for soundness, diagnosing and treating various diseases affecting live stock, examining farm buildings, and studying the sanitary handling of milk and its by-products.

Students in Dairy Laboratory.

OTHER COURSES MAY BE TAKEN.

It should not be overlooked by those who are not interested in cotton growing or stock farming that the College of Agriculture is prepared to offer ten days' and three months' courses of instruction of a most practical nature in agriculture, soils, horticulture, farm mechanics, forestry, and veterinary medicine.

Those desiring further information should write to

ANDREW M. SOULE, President,
State College of Agriculture,
Athens, Ga.

SHORT COURSES FOR FARMERS

IN

Cotton Industries **Cereal Production**
Live Stock Farming **Horticulture**

January 2nd to 13th, 1912

Tuition Free. **No Entrance Examination**

INTRODUCTION.

The popularity of the Cotton School conducted annually by the College of Agriculture and the desire for instruction on a wider range of subjects pertaining to an advanced agricultural practice makes the re-adjustment of the work of the Cotton School advisable. While this course is retained and its character improved in many particulars, other courses have been added designed to meet the needs of Georgia farmers who desire to specialize in cereal production, animal industries and horticulture. Those attending the short courses for farmers, which open on January 2, 1912, and continue for a period of ten days, will therefore have an opportunity of specializing along four distinct lines, which will permit former students to return and continue their studies, and enable new students to specialize along the line of primary interest to them.

The Farmers' Short Courses are held in Agricultural Hall, one of the best academic buildings in the south, and admirably equipped in every respect for instruction in all phases of agricultural industries. The College of Agriculture has a staff of twenty experts, and those attending will have the privilege of conferring with these men and acquiring as much information outside of the regular course as their time will permit. The courses are intensely practical, and according to the testimony of former students have repaid them many times over for the expenditure of time and money required to take them. Shakespeare said, "There is a tide in the affairs of men which taken at the flood leads on to fortune." These courses afford the opportunity thousands of Georgia farmers have been looking for. Do not neglect this chance to increase your knowledge and advance your status as a citizen.

FREE LECTURE SHEETS.

The lectures offered in the several short courses will all be summarized and presented in mimeograph form to all students. When the school is over each pupil will have about fifty lecture sheets comprising a ready reference book on the special line of study which he has pursued. Over seventy hours of instruction are provided in each of the short courses, and those attending will find their time most fully and profitably occupied.

Course in Cotton Industries.

An outline of this course will be found in the following pages. The department is admirably equipped for the work it proposes to offer. The fiber-testing laboratory is provided with apparatus for testing and studying the fibers of cotton. Students are urged to bring samples for examination. The very best facilities for studying grades and grading are available. Data of incalculable value are being obtained from the demonstration field, and afford the basis of instruction offered along various lines. Those desiring to acquaint themselves more intimately with the selection and improvement of cotton will find this course invaluable.

Ten Lectures on Soils. The type soils of Georgia will be studied from the standpoint of origin, physical and chemical properties, present condition and needs. A special study will be made of the physical properties, the water supply and movement, cultivation, and the use of green and stable manure. Professor Fain.

Ten Lectures on Fertilizers. A careful study will be made of the effect of various mineral elements in the soil on plant growth; the best means of supplying those in which the soil is most likely to be deficient; the sources of nitrogen, phosphoric acid and potash, and methods of purchasing, mixing and applying these various constituents to the soil for the purpose of producing maximum crops. Liming soils, crop rotations and their relation to maintaining the plant food supply will be discussed. President Soule.

Five Lectures on the Cotton Plant. These will include the history of the cotton plant, conditions most favorable for its growth, and how these can be brought about in the soil; classification of cotton according to varieties; varieties of cotton as affected by soil environment; the study of indivdual plants and methods of selection for improving the crop; results of experimental tests and demonstrations on the yield and economic value of the leading varieties of cotton grown throughout the South. Two lectures illustrated by stereopticon. Professor DeLoach.

Five Lectures on Cotton Cultivation. These lectures will include the preparation of land; the best methods of applying fertilizers; when to apply same; details of preparation immediately before planting; how and when the cultivation of young plants should be begun, and the kinds of implements best suited to these purposes.

Professor DeLoach.

A field of cotton hybrids.

Five Lectures on Cotton Diseases. The principal diseases affecting the cotton plant, the causes so far as known, and the best methods of combatting and eradicating the same will be discussed in detail. Anthracnose, for instance, is making serious inroads in southern cotton fields, and yet it is a disease practically unknown to the majority of our farmers. It is high time that something was done to check not only this, but the ravages of various other diseases. Two lectures illustrated by stereopticon. Professor DeLoach.

Five Lectures on Cotton Insects. There are various insect enemies of cotton, some of which are seriously reducing the yields obtained in the south. In these lectures, the history, characteristics, and the best method of controlling the depredations of the various insects attacking the cotton plant will be discussed.

Professor E. L. Worsham.

Five Lectures on the Chemistry of Cotton By-Products. These lectures will deal with the preparation, history and commercial uses of such by-products as cotton seed oil, soap, paper, cellulose, gun cotton, artificial silk and hair, and viscose, which is used in making artificial leather and building material. Samples of the various by-products will be used for illustrative purposes.

Professor W. A. Worsham.

Five Lectures on Cotton Machinery. Owing to the scarcity and high price of labor, every means which will reduce the cost of production must now be employed by the cotton planter. Therefore, the different forms of plows, cultivators and seeders which may be utilized so as to ecoonmize labor and increase the efficiency of soil cultivation will be considered, and as far as possible, the various implements discussed will be exhibited before the class.
Professor L. C. Hart.

Ten Demonstrations in Cotton Grading. In this course the student will have an opportunity to handle and grade samples of cotton each day. Each student will record his classification on a printed card, and on the conclusion of the examination of the various samples, the instructor in charge will compare the various samples with the standards used by the class and will give the reasons for grading each sample so the student can see wherein he has made a mistake and can thus profit by the knowledge obtained. Mr. Crane.

Three Lectures on Marketing Cotton. This discussion will include the necessity for care in picking cotton so as not to gather trash and diseased bolls; the weighing, sampling, practical handling, management and grading of the cotton until it is finally disposed of will be discussed in detail. The organization of cotton warehouses with suggestions for the necessity of such institutions, at least till we learn a better way of handling the crop will receive special attention. Professor DeLoach.

Course in Cereal Production.

This course is broader than its name implies, and includes a consideration of seed selection and crop rotation—two matters of vital importance to the welfare of Georgia agriculture. The wide-spread interest in increasing the yield of corn and growing a greater variety of cereals constitutes the primary reason for offering this course. The department of agronomy has every facility for carrying on the work in the most effective manner. Experiments in corn breeding and cereal production have been conducted in the demonstration field for several years, and furnish an abundance of data of vital importance to the students specializing along these lines. The improvement of corn through seed selection can only be accomplished with certainty when the underlying principles of plant breeding and cereal judging are properly understood. Hence these subjects are strongly emphasized in the course in cereal production. The course of instruction is as follows:

Five Lectures on Insects Injurious to Grain. Under conditions existing in Georgia a great deal of damage is done the cereal crop by various insects, both in the field and after storage. A study of the life history of the more injurious insects will be made with suggestions as to methods of control. Professor E. L. Worsham.

Ten Lectures on Seed Selection. All cereals may be greatly improved both as to yield and quality of grain through seed selection. Experience shows that the seed used in Georgia should be produced at home. There are certain definite principles underlying seed selection. Attempts to improve cereals without a knowledge of these generally prove unsatisfactory. On this account the methods and principles involved in seed selection will be taken up step by step and pointed out to students pursuing this course. The data obtained in the College demonstration field will be used as the basis of instruction. Professor Rast.

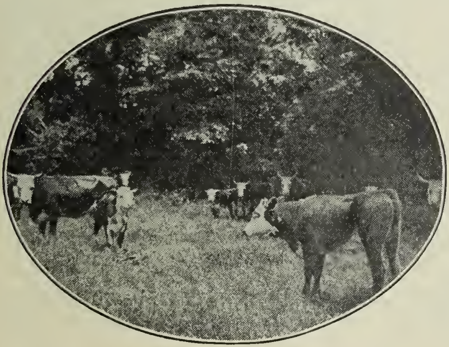
Ten Lectures on Crop Rotation. On account of the low price of cotton this year, systems of management that will give more than one crop to put on the market will be of special interest. Crop rotation is undoubtedly the solution for smaller acreage and higher production per acre, as well as a means of having more than one crop for market. Different systems of rotation will be studied, also the influence of the rotation on general farm work. Special attention will be given to cover crops and their use in the state.

Professor Fain.

Ten Demonstrations in Cereal Judging. Great interest is now being taken in the production of the cereals in the state. A study of the various varieties of cereals is therefore important at this time. Cereal judging will include a systematic study of varieties by the score card, by actual measurement and scales, as well as germination tests. This course will be especially helpful to thosewho are seeking new varieties for their farm, as it will bring them in contact with a number of different varieties and they will be able to study them at first hand. Professors Fain, Vanatter and Rast.

Students taking this course will also elect fertilizers, soils and farm machinery.

Course in Live Stock Farming



Georgia farmers have more than fifty million dollars invested in live stock, and in spite of this fact at least one-tenth of the value of the cotton crop is put into renewing live stock industries which should be developed within the borders of the state. On this account, a ten-day course of instruction for farmers who desire to specialize in live stock farming has been arranged at the College. The College farm comprising 730 acres affords many useful lessons to the students in this department, since it is operated and managed on the basis of a stock farm. There are several barns and other buildings on the farm, the main barn being 40x120 feet, and the dairy barn 40x70 feet. Herds of pure-bred Jerseys and Holsteins and grade dairy cattle are maintained; also a herd of Holstein cattle. Percheron horses are used as the foundation for the work in horse breeding, while hog production is represented by the Tamworth and Berkshire breeds. More than 150 head of live stock are kept on the farm, thus providing ample facilities for students to learn the characteristics of the different breeds, and the best methods of feeding and handling the same for economic results. The department of veterinary science has a laboratory building where the diseases of live stock and clinic work are carried on. The course of instruction is as follows:

Beef cattle are maintained at low cost on the farm.

Ten Lectures on Feeds and Feeding. This course will review the sources of feeding stuffs available for the maintenance of live stock, special emphasis being laid on the value of cotton seed and its by-products, and all other materials produced in the state which can be utilized to good advantage in animal nutrition. The gross anatomy and physiology of the digestive organs, and the preparing and compounding of balanced rations for maintenance, milk and butter production, and for fattening and growth will be given consideration. Professor J. W. Hart.

Ten Lectures on Breeds and Breeding. In this course the origin, history and development of the various breeds of horses, cattle, sheep and swine adapted to Georgia will be considered. Methods of introducing improved animals will be discussed, and attention will be given to the subject of animal breeding which will include a consideration of selection, heredity and the other fundamental laws concerned in animal reproduction. Professor Jarnagin.

Ten Lectures on Diseases of Farm Animals. This will include a demonstration of the anatomy of the horse and cow by means of charts and models, together with an explanation of the process of digestion in these animals and a discussion of proper feeding methods; a review of the methods used to control and eradicate contagious diseases of live stock, including U. S. quarantine regulations concerning the transportation of animals affected with contagious diseases and disease-producing parasites; a consideration of some of the more common diseases and ailments of farm animals, together with means of prevention and methods of treatment.

Dr. Burson.

Five Clinics to demonstrate the method of administering Anti-Hog Cholera Serum and other biological products and a demonstration of the method of examination of horses for soundness, together with a consideration of the seriousness of various blemishes and unsoundnesses from an economic standpoint.

Dr. Burson.

Five Demonstrations in Stock Judging. For the students electing the live-stock course practical work will be given in the afternoons in scoring the farm animals, as well as actual work in show ring placing. While the time is very short the fundamental principles underlying the selection of profitable farm animals can be acquired in this course.

Professor Jarnagin.

Students taking this course will also elect fertilizers and soils.

Course in Horticulture

Many persons are intensely interested in securing more definite knowledge concerning orchard management. This is especially true since the wonderful possibilities of apple production in north Georgia have become more generally appreciated. To meet this public demand a specialized course in horticulture has been provided. The department has excellent laboratories and laboratory equipment at its command. About thirty-five acres of the college farm have been set aside for horticultural purposes. This field has been plotted, and an orchard containing varieties of apples, peaches, pears, plums and other fruits should bear next year. Some attention has also been directed to truck gardening and the development of ornamental plantings about the grounds. The department possesses adequate barns, spray laboratories and equipment for demonstration work in pruning and other subjects in which horticulturists should naturally specialize. Those desiring to acquire special information concerning work of this character will find the course offered very acceptable.

Five Lectures on Varieties of Fruit. In this course will be given a discussion of the varieties of apples, pears, peaches, etc., as recommended for commercial culture in the various sections of the state by the Horticultural Society. Professor Firor.

In the horticultural laboratory.

Ten Lectures on Orchard Management. These will include discussions of site, location, choice of plants, planting, tillage, cover crops, fertilization, pruning, thinning, frost, spraying, picking, packing and selling. Professor McHatton.

Five Lectures on Diseases of Fruit. Brown Rot, Apple Scab, Pear Blight and the other diseases incident to the culture of the tree fruits in Georgia will be considered. Professor McHatton.

Five Lectures on Insects of Fruits. The Codling Moth, Plum Curculio, Peach Borer and other insects incident to the culture of tree fruits in this state will be discussed.
Professor E. L. Worsham.

Ten Demonstrations in Spraying and Pruning, consisting of practice in mixing and applying sprays, fighting frost, pruning trees, etc.
Professors McHatton and Firor.

Students taking this course will also elect fertilizers, soils and farm machinery.

c
296u2aC
912/13

Annual Report of the President

Georgia State College of Agriculture and the Mechanic Arts

UNIVERSITY OF ILLINOIS LIBRARY
MAR 6 1917

UNIVERSITAS GEORGIAE · ET DOCERE ET RERUM EXQUIRERE CAUSAS · 1785

—TO—

BOARD OF TRUSTEES

Georgia State College of Agriculture

JUNE, 1913

Report of the President, State College of Agriculture and the Mechanic Arts

To the Honorable Board of Trustees
of the University of Georgia.

Gentlemen:

The State College of Agriculture and the Mechanic Arts has made substantial progress during the year now closing. The various lines of work which naturally fall within its province have been advanced as rapidly as the facilities at hand permitted. Judged from the standard of attendance, coöperation between students and faculty, and the correlation of various agencies affecting the welfare of the institution, the year has been the most successful in its history.

UNIVERSITY OF ILLINOIS LIBRARY
MAR 6 1917

ENROLLMENT OF STUDENTS.

The number of students enrolled was 547, of which 199 were in the College of Science and Engineering, and 348 in the College of Agriculture. There were 157 men pursuing degree courses in the College of Science and Engineering. The registration surpassed 1912, which is the best evidence of public interest in this type of education. An analysis of the enrollment in the College of Agriculture shows that six men applied for the Master's Degree and 125 for the Bachelor's Degree in Agriculture. Including the one-year course and special students, 185 long-course men were registered, the remainder being short course students. The increased attendance upon the degree courses over 1912 is approximately 26 per cent., and 55 per cent. in all courses. Every section of the state was well represented. The inadequacy of the present facilities and equipment has been emphasized in previous reports. Should a like increase occur in 1914, the institution as a whole would be unable to properly care for those seeking admission to its courses. This situation presents a serious problem for your consideration and solution.

GRADUATES.

The graduating class is the largest in the history of the College, and as in former years the majority of the young men have already found remunerative employment of a satisfactory character. Several of them are returning to their farms where they can be employed to advantage as demonstration agents, thus enabling them to take an active part in upbuilding the agricultural interests of their respective communities.

The value of the training afforded by the College is well illustrated by the record of one young man who netted $4500.00 from his farming operations last year, and was the prime mover in introducing a new industry into his county. Another student has maintained a series of test plats on his farm for some years. As a result, his neighbors have been greatly helped and he claims to have saved $1000.00 annually. These examples are cited not for the purpose of emphasizing the material side of the training offered in the College of Agriculture, but to illustrate that the scientific principles taught therein can be applied successfully in practice. The prejudice against book farming which has so long existed is rapidly giving way before demonstrations of this character. The high standard accorded the College in previous years by capable judges has been maintained, the accomplishments of the graduates in the fields of research, instruction, practical farming, editorial and commercial vocations related to agriculture amply illustrating this fact. The opportunity for young men competently trained along agricultural lines is greater than ever before in the history of Georgia. The time is ripe for the appointment of an agricultural agent in every county in the state. High schools desire teachers who have specialized in agriculture and at the same time enjoy a liberal education. Industrial organizations of every description are seeking men, and there is a constant call both from within and without the state for investigators.

GRADUATE COURSES.

The interest in graduate work continues, and for the first time in the history of the University, the degree of Master of Science in Agriculture has been awarded. There is urgent need for additional facilities and instructors in order that graduate work may be promoted to the best advantage. It has been difficult to provide for the needs of all the courses offered during the past year on account of financial limitations and an overcrowded schedule of the head professors in the several departments upon whom provision for work of this character falls most heavily. Graduate courses must be encouraged for they give an atmosphere to an institution and facilitate lines of research which otherwise could not be undertaken. The offering of graduate courses is highly beneficial to the professor as it stimulates him in a direction which might otherwise be neglected. Agriculture offers one of the most desirable fields for research at the present time. There are an unlimited number of problems of fundamental importance which have only been investigated in a cursory manner. The solution of these questions would win renown for the institution, its students and professors, and at the same time be of material service to the primary industry of Georgia. I sincerely hope, therefore, that every effort will be made to properly provide for graduate courses in all departments of the State College of Agriculture and the Mechanic Arts. The Dean of the Graduate

School has through his wise counsel and advice greatly facilitated the work of both students and professors during the year, and it affords me pleasure to bear tribute to the very substantial assistance he has rendered in this direction.

REPORTS OF PROFESSORS.

The reports of the various professors are transmitted for your information. The personnel of the faculty continues to win commendation for the institution both at home and abroad. The professors have remained loyal to the trust imposed upon them in spite of many tempting offers to go elsewhere. This fact indicates their high purpose more completely than any statement of mine could convey. Since College professors are among the most poorly paid men in view of the long years of training which they must undergo to perfect themselves and the exactions which society places upon them, surely any special service which they render should be cheerfully recognized. In this connection, I desire to say that without the aid, support and coöperation of the faculty an executive can accomplish little, and the part the professors have had in building up and maintaining the proper esprit de corps in the institution should never be forgotten.

CHANGES IN STAFF.

A number of changes in the staff have taken place during the year.

J. E. Turlington resigned on March 1st as adjunct professor of agronomy extension to become principal of one of the new agricultural schools of North Carolina at a material advance in salary.

R. J. H. DeLoach, professor of cotton industry, has resigned, effective August 1st, to become Director of the Georgia Experiment Station, at Griffin. It is gratifying to know that his valuable services will not be lost to the University system.

R. S. Hollingshead, instructor in soil chemistry, has resigned, effective October 1st.

Louie H. Smith resigned as librarian on September 1, 1912.

M. C. Gay resigned as district agent in extension-demonstration work on July 1, 1912, to become principal of the Ninth District Agricultural School at Clarkesville.

G. E. Rice resigned as special agent in extension-demonstration work on February 1, 1913, to accept a position with the German Kali Works.

George A. Crabb, B.S.A., Ohio State University, and until recently connected with the Bureau of Soils, U. S. Department of Agriculture, was appointed adjunct professor of agronomy extension.

L. E. Rast, B.S.A., University of Georgia, was promoted to the position of adjunct professor of cotton industry.

R. R. Childs, B.S.A., M.S.A., University of Georgia, was appointed instructor in agronomy extension.

L. S. Watson, B.S.A., University of Georgia, was appointed instructor in agronomy extension.

Charles A. Whittle, B.S., University of Tennessee, was appointed editor-librarian.

H. B. Carpenter, B.S.A., University of Missouri, was appointed instructor in animal husbandry.

The following men have acted in the capacity of tutors during the year: C. M. Kiger, horticulture; B. H. Stone, forestry; R. R. Childs, agronomy.

The following men have acted in the capacity of student assistants in farm mechanics during the year: Wilbe R. Wilson, Elmo Ragsdale, and L. G. Proctor.

The coördination of the Farmers' Coöperative Demonstration Work with the extension service of the College of Agriculture resulted in the promotion of J. Phil Campbell to the position of State Agent in charge of farm demonstration work and boys' and girls' clubs.

J. K. Giles, B.S.A., University of Georgia, was appointed assistant state agent with headquarters at Athens.

The following are the names of the district agents in the demonstration work with their local stations: William Bradford, Cedartown; J. Walter Hendricks, Savannah; G. V. Cunningham, Tifton; J. G. Oliver, Macon; S. M. Cown, Union City; C. M. James, Columbus.

The appointments recorded in a previous report have proven satisfactory. The Board now has in its employ some 46 persons. Of this number 20 would be regarded as strictly in the extension service though all employees of the College do some work of this nature. In fact, the heads of divisions are responsible for the special lines of extension work which fall within the province of their departments.

NEEDS OF THE COLLEGE OF SCIENCE AND ENGINEERING.

The imperative need of the College of Science and Engineering is money for additional equipment and the proper maintenance of its laboratories. The scientific departments are not properly equipped in many instances. This tends to discourage both instructors and students and militates against the efficiency of the courses offered. While buildings are of the utmost importance, men and equipment must take precedence over them. The departments in question can not be properly taken care of without an appropriation of at least $10,000.00 a year. This matter has been recommended in every previous report, and it is of such essential character that a concerted effort should be made to secure the funds in question from the approaching session of the Georgia General Assembly.

ROAD EXTENSION WORK.

The School of Civil Engineering through its road extension department is doing excellent work. Requests for assistance show a decided increase. The equipment of the road laboratory has been greatly improved, arrangements having been made for the testing of cement. Much information has been disseminated through correspondence. A road school and a conference were arranged for at the University. These meetings were well attended and undoubtedly accomplished much good. Several important bulletins have been prepared and distributed during the year. Plans for the construction of eight large bridges and some forty-eight smaller structures were sent out during the year. This work of itself saved the counties concerned at least $800.00 in architectural fees. Representatives of the department traveled 4036 miles and inspected 586 miles of road in seventeen counties. 271 soil samples were analyzed in the road laboratory for 27 counties. Seven addresses were made in five counties. This brief summary of the work shows its growth in popular favor and the intimate relation it bears to the construction of a permanent system of highway throughout the state.

DEPARTMENT OF BUSINESS ADMINISTRATION.

The establishment of a department of business administration under the general direction of Dr. Curtis is one of the most important developments of the year. Courses of this character are very much needed and are rapidly finding favor with business men. The records show that a large percentage of the young men graduating from the University enter commercial lines, and it will be greatly to their advantage to have received a thorough grounding in the principles underlying industrial pursuits. The department is sorely in need of additional instructors and facilities. Financial conditions are such as to render additional appropriations from the state necessary to adequately support this work. No doubt this matter will receive the careful consideration at your hands which its importance merits.

LIBRARY.

Books constitute an essential part of the equipment of a technical institution. Therefore, a constant effort is being made to build up the library of the College of Agriculture. There are now more than 2200 books and over 10,000 reports and pamphlets available to students, while more than 300 magazines and papers are regularly received. The library has been rearranged and the reading room greatly improved, while the books in the stacks have been protected without rendering them inaccessible. The library is one of the most important laboratories of the institution, and it is imperative that a larger support fund be made available so that it can be brought up to the highest standard of efficiency. Scientific works are costly, and many of the most valuable now appearing can not be immediately purchased for lack of funds.

EDITOR.

The appointment of an editor is chronicled with great satisfaction. The selection of Prof. Whittle for this position was fortunate as he has had large experience in all phases of newspaper and magazine work. He has not only edited the monthly bulletins in an acceptable manner but has prepared and sent out the plate and copy service which is used by about 175 papers each week. This has given the College an audience of 350,000 readers and has proven very popular. This work was not undertaken with the idea of advertising and the matter sent out is not so regarded either by the editors or their readers. The information sent out has been of such a practical nature that many of the suggestions have been utilized to good advantage by the farmers. The inauguration of this service has enabled the College to take the information at its disposal out of "cold storage" and put it before the people in an effective form at a minimum of cost to the state.

SHORT COURSES FOR BOYS AND GIRLS.

The short courses previously inaugurated for farmers have been continued and were well attended. Some sixty of the county demonstration agents were in attendance for two weeks that they might receive special instructions concerning the various lines of work they are carrying on in their respective communities.

A short course for boys and girls was offered for the first time. Some 35 boys and 14 girls were enrolled. Every one of these young people came as the result of receiving a scholarship of $25.00. All of these scholarships were awarded for proficiency in the work of the corn or canning clubs, and were offered by various agencies, such as women's clubs, county boards of education, chambers of commerce, industrial corporations, and private citizens. The Central of Georgia Railway contributed a number of these scholarships. The boys and girls enjoyed the work greatly and profited by it as completely as the older people in attendance. Miss Cresswell organized a special course for the girls and her efforts in this direction are worthy of the highest commendation. A special course will be organized for the boys in 1914. Already a large number of scholarships have been provided for both boys and girls and the attendance promises to double that of the past year. Bringing these young people in contact with the work of a state institution at the most impressionable time in their lives and permitting them to see the great opportunities which proper training along specific lines affords them appears to be one of the most wholesome things which the College has undertaken to do in the line of general welfare work.

FARMERS' CONFERENCES.

The usual farmers' conferences in coöperation with the State Dairy and Live Stock Association, the Georgia Breeders' Association, and the State Horticultural Society were held at the College in January. Each of these organizations has again selected the College as the place for its annual meeting. The attendance was better than in previous years, and the most cordial relations exist between these associations and the staff of the College.

A number of excursions were made to the College by representative groups of farmers. In all about 1000 people visited the institution. These excursions came from Jackson and Putnam counties. Arrangements are now being perfected for excursions from Franklin, Bibb and other counties. The College thus becomes more and more a center of information to the farmers of the state.

DISTRICT AGRICULTURAL SCHOOLS.

A meeting of the principals of the district agricultural schools was held in my office on May 19th resulting in a very profitable conference. The course of study as prescribed by the University has proven very satisfactory and has been carried out by most of the schools. Only minor changes were made in the course. The wisdom of the course advised is shown by the fact that the officers of the U. S. Bureau of Education accord the district agricultural schools of Georgia the honor of ranking as secondary schools of agriculture, while those of some other states are only rated as high schools. The University has thus been largely instrumental in assisting the schools to maintain an efficient course of instruction along the lines prescribed by the law governing their establishment. In other words, it has prevented them from becoming ordinary high schools and failing to serve the true function for which they were organized.

Extension schools were held in connection with the different schools during the year, and arrangements are now being made to hold institutes in association with them. The schools have been visited by representatives of the College and have been examined as in the past by Prof. Stewart who has discharged this special duty in a very thorough and acceptable manner. He has also prepared the fourth annual report which has been printed and distributed according to your instructions. The College and its officials stand ready in every way to serve and advance the best interests of the district agricultural schools. Your attention is respectfully directed to the recommendations made in the letter of transmittal accompanying the fourth annual report. No doubt the matters touched on therein will receive your careful consideration.

EXTENSION WORK.

The work of the extension department falls under two heads, namely, that associated directly with the several departments of the institution, and that carried on through the office of the secretary of extension work. Under the latter head are included such informal teaching agencies as the farmers' institute, teachers' institute, boys' and girls' clubs and fair exhibits. A summarized report of the meetings held, the counties visited, the attendance and the miles traveled is presented for your information.

Kind of Meeting	Number	Counties	Attend'ce	Mi Trav.
Extension or Short Course Schools for adult farmers	54	53	13956	18595
Farmers' Institutes for farmers and farmers' wives	120	120	23350	24144
Teachers' Institutes to show how agriculture may be taught in rural schools	20	20	1842	11556
Boys' Corn Clubs to demonstrate value of scientific agriculture	485	139	64386	68008
Girls' Canning Clubs to bring new art and industry into homes	360	43	12400	10513
Miscellaneous meetings to discuss agricultural problems	53	38	3222	6845
Meetings at College of State Agricultural Organizations	3		1000	
Excursions to College	2			
Total	1096		120156	139661

Note: Does not include demonstration work in 65 counties carried on with 6000 farmers on acre test plats of corn, cotton, etc.

EDUCATIONAL EXHIBITS AT GEORGIA FAIRS.

Name	Place	No. Days	No. Visitors
State Fair	Macon	10	15,000
Georgia-Carolina	Augusta	7	10,000
Alabama-Georgia	Columbus	10	7,000
South Georgia	Tifton	10	6,000
Jackson County	Commerce	5	5,000
Hart County	Hartwell	5	4,000
Total	6 fairs	47	47,000

This record has never been surpassed by an educational institution in the south. You will observe that 1096 meetings were held in the several counties attended by 120,156 people. This required 139,661 miles of travel. Educational exhibits were made at six fairs attended by 47,000 visitors. Fifty-four two-day extension schools were held. A syllabus of the lectures was prepared and distributed as in 1912. Arrangements are now being completed for the holding of 143 farmers' institutes the present summer. This will necessitate a two months' campaign. This work is performed by our College professors when most teachers are enjoying a holiday. No extra compensation is given for this service. The continued amplification of the work without additional funds is manifestly impossible. The $2500.00 appropriated for institute work is absurdly out of proportoin to the interests it is expected to serve. Teachers' institutes can not be attended in many instances although they afford the most practical method of demonstrating how environmental material should be used in the teaching of elementary agriculture as required by law. A special appropriation for this purpose is one of the most pressing needs.

BOYS' AND GIRLS' WORK.

The boys' and girls' clubs continue to prosper. Last year was by all odds the most successful in the history of this movement. This work was first promoted by the University. Those who are in position to know say that the most effective work of this character has been done in Georgia. In 1910 one agent was employed and work undertaken in forty counties. In 1913 there are eight agents and work in progress in 139 counties with an approximate enrollment of 10,000 boys and 2500 girls. The average yield of corn per acre in 1910 was 45 bushels; in 1911, 54 bushels; and in 1912, 60 bushels. In 1912, 72 boys produced on 72 acres 9088 bushels or an average yield of 125 bushels per acre. 2500 boys produced on 2500 acres, 150,000 bushels, or an average yield of 60 bushels per acre. 10,000 boys produced aprpoximately 400,000 bushels of corn at a cost of $156,000.00 and a net profit of $244,000.00. The yield of corn in Georgia has increased nearly 18,000,000 bushels in the past three years. Undoubtedly, the club movement is responsible for a considerable part of this increase. The club movement has also demonstrated that corn may be grown successfully in all parts of the state. The results obtained have illustrated the relation of science to successful farming and have taught thrift, industry, perseverance and integrity.

The girls' canning clubs made splendid progress in 1912. The enrollment was approximately 2500. The girls were responsible for the preservation of 100,000 cans of fruit and vegetables worth $10,000.00. With more money one million cans may be put up. The organization for 1913 includes 28 counties and 27 local agents. As an illustration of the efficacy of this work, 16 girls in Decatur county put up from their one-tenth acre gardens products worth $604.00. The average cost of cultivating each one-tenth acre was $19.68; the average profit per garden $46.50, or at the rate of $465.00 per acre. Danie Wicker, of Macon county, led the state with a profit of $72.93 from her tenth-acre garden. Many other girls made surprisingly good yields and proved themselves to be efficient workers. The girls' clubs stand for the introduction of a new art and industry into the home, the saving of from thirty to fifty thousand dollars per county now sent out of the state each year for canned goods, the emphasis of industrial courses in the schools, the development of self-reliance, organizing ability and independent sources of revenue for girls. The home dietary will of necessity be improved and fundamental knowledge acquired.

DEMONSTRATION WORK.

The coördination of the Farmers' Coöperative Demonstration Work of the Bureau of Plant Industry, U. S. Department of Agriculture, with that of the College has been a distinct gain to all the interests concerned. Besides the state and district supervisors previously mentioned, there are now 65 county demonstration agents. These men select in their respective counties farmers who are willing to make tests of newer and better methods and visit them weekly throughout the year. They also supply them with bulletins and such information from the College and U. S. Department of Agriculture as they may desire with reference to soil cultivation, fertilization, seed selection, etc. Last year there were 12,000 acre demonstrations on cotton and 13,000 acre demonstrations on corn. The average yield per acre with corn was 35 bushels, and with cotton 1250 pounds of seed cotton. This is three times the present average yield of these crops in Georgia and shows the effect of carrying the elementary principles of science out to the farmer in some manner as the demonstration work makes possible. It is believed that this work should now be extended to include a study of crop rotations, and that pig and poultry clubs should be organized for the boys and girls. It is desirable that more money be made available so that the local agent may have a central office, say at the county seat. Naturally, an agent should be placed in every county as soon as practicable. To do this the state must add largely to the present appropriations for extension work.

Ten counties, namely, Milton, Pickens, Bibb, Habersham, Hancock, Lowndes, Twiggs, Wilkes, Appling and Muscogee, are now contributing $4500.00 annually to the support of a county agent. Already, six additional counties, namely, Floyd, Coffee, Ben Hill, Jackson, Cobb and Cherokee, have raised $2500.00 for a similar purpose and ask the coöperation of the joint agencies concerned in the maintenance of an agent. These requests can not be acceded to because of insufficient funds. Can the state afford to ignore these calls for assistance and withhold vital agricultural knowledge from her farmers when they are willing to bear a part of the expense?

PUBLICATIONS.

The following publications were issued during the year:

Name	Edition	Pages per copy	Total pages
Canning of Fruits and Vegetables - - -	15,000	20	300,000
Proper Utilization of Cotton Seed Meal	25,000	24	600,000
Hog Cholera and Preventive Serum - -	15,000	22	230,000
Report on Cotton Cultivation, 1912 - -	15,000	8	120,000
Lime and Its Uses in Georgia - - - - -	15,000	6	90,000
Short Courses for Farmers, 1913 - - -	10,000	8	80,000
Boys' Corn Club Work, 1912 - - - - -	15,000	22	230,000
Outlines of Extension School Lectures -	10,000	30	300,000
Girls' Club Work in Georgia, 1912 - -	5,000	22	110,000
College Catalogue, 1913-1914 - - - - -	3,500	100	350,000
Farmers' Conference Report, 1913 - -	2,500	200	500,000
Announcement Summer Cotton Grading Course - - - - - - - - - - - - - - - -	2,000	4	8,000
Fourth Annual Report of Congressional District Agricultural Schools - - -	2,000	40	80,000
Soil Analysis of Ben Hill County - - -	2,500	24	60,000
Method of Tick Eradication - - - - - -	5,000	8	40,000
Total - - - - - - - - - - -	142,500	538	3,098,000

Since the College was reorganized more than sixty bulletins and circulars have been prepared and distributed in editions approximating 640,000 copies and containing 15,000,000 pages, yet in spite of the steady increase in expenditures for work of this character we are quite unable to supply the demand for agricultural literature. There are over 25,000 names on the mailing list.

PRIZES AND GIFTS.

A number of prizes and scholarships have been offered to students for proficiency as in the past. These funds have been contributed by the Virginia-Carolina Chemical Co., of Richmond, Va.; H. G. Hastings & Co., Atlanta, Ga.; American Coal Products Co., New York, N. Y.; T. W. Wood & Sons, Richmond, Va.; De Laval Separator Co., New York, N. Y. H. G. Hastings & Co. gave a scholarship of $250.00 to the boy producing the largest number of bushels on an acre in 1911. This scholarship was awarded to Ben Leath, who raised 214 bushels on a measured acre of land. A scholarship of $100.00 given by Hon. Gordon Lee was won by Mance Allison. The Southern Railway Scholarships, each of the value of $250.00, were awarded to Horace Lasseter and Pope R. Hill. Both of these young men are in College and have made a good record during the year. The awards were made as the result of a competitive examination in which quite a large number of candidates participated.

H. W. Blake, of Ball Ground, donated twelve pens of chickens for experimental breeding work to the poultry department. Fertilizers, lime and implements to the value of $325.00 were contributed to the department of agronomy. The horticultural department received gifts of spraying material and apparatus to the value of $125.00. The department of cotton industry received samples of cotton. Books, magazines and other materials of value and service to the institution have been contributed from a great variety of sources. In all over $3500.00 were contributed for scholarships and the furtherance of the educational work of the college.

COOPERATIVE RELATIONSHIPS.

The policy of the Board of Trustees has been to encourage coöperation whenever possible with all state and national agencies. As a result, the College is carrying on extension-demonstration work with the Bureaus of Soils, Animal Industry and Plant Industry of the U. S. Department of Agriculture. In the first instance, a physical-chemical soil survey is being carried on in a number of counties. The physical examination is made jointly, the chemical work being done in the College laboratories. The dairy division of the Bureau of Animal Industry is assisting the College in maintaining a field agent in dairying. The Office of Farm Demonstrations of the Bureau of Plant Industry is coöperating with the College in maintaining the work of the boys' and girls' clubs and the demonstration work for adult farmers. As a result, the College of Agriculture is receiving assistance through federal appropriations amounting to $55,000.00. It is the general policy of the U. S. Department of Agriculture to ask the state to bear half of the expenses associated with coöperative enterprises. It is clear that the College is quite unable to do its part at the present time. In order that the relationships now existing may be maintained on their present harmonious and helpful basis, it is very important that the state appropriate a sufficient sum of money to enable the College to bear its pro rata share of the expense. If this is not done it is almost certain that a part of the funds now expended in Georgia will be withdrawn and used in other states where larger appropriations have been made for the maintenance of coöperative enterprises. Surely the legislature will not permit this calamity to befall our agricultural interests.

The College is coöperating with the State Department of Agriculture in every possible way, the Commissioner and his assistants being invited to attend institutes and extension schools. Representatives of the State Board of Entomology are also invited to attend these meetings. The boys' corn and girls' canning clubs are carried on in association with the public school system. This work has the general approval and support of Superintendent M. L. Brittain and his state supervisors. The county school commissioners, county boards of education and the teachers are all parties to the coöperation and full credit for the service rendered the work in progress by these various agencies is cheerfully accorded them. The Central of Georgia Railway is coöperating with the College in the maintenance of important test farms. The chambers of commerce of Atlanta, Savannah, Macon, Tifton and Columbus are assisting in maintaining local district agents for the boys' corn and girls' canning clubs. The Georgia Bankers' Association, the Cotton Seed Crushers' Association, the State Fair Association, and many local boards of trade are also actively participating in the work. It is doubtful if any institution in the south is working in harmony and sympathy with such a large number of agencies as the Georgia State College of Agriculture.

The agencies enumerated are contributing to the maintenance of the district agents for the boys' corn clubs $4500. For the canning clubs $2675.00 has been raised. Of this sum $1925.00 was subscribed in 27 counties. Six fair associations offered premiums for boys' and girls' clubs aggregating $11,000.00. County fairs through local subscriptions raised another $10,000.00 for the boys' work and $2500.00 for the girls. Including the amount subscribed for adult demonstrations and the prizes and scholarships awarded through the College, the extension-demonstration work received directly and indirectly financial support amounting to $38,475.00. Including the funds expended in Georgia as a result of coöperation with the United States Department of Agriculture, two dollars has been secured for the support of this work to one appropriated by the state. The College has thus more than fulfilled its promise to the legislature to raise an amount for extension work equal to the sum set aside by the state for this purpose.

THE COLLEGE FARM.

The College farm has been substantially improved during the year. The Commissioners of Roads and Revenues of Clarke County have aided greatly in this work through the construction of a road from the rear of the power house to the main barn on the Carlton farm. The work done would have represented an outlay to the College of between $1000.00 and $1200.00. In spite of the unfavorable crop season the receipts surpassed those of 1912 irrespective of the fact that the inventory shows an increase in the value of the live stock amounting to $1740.00. The receipts total $8581.53 and the profit on the farm will be about $2000.00. The dairy herd earned $5572.26, which is an increase of $472.72, equivalent to almost $40.00 a month. The herd now consists largely of animals bred under the direction of the department of animal husbandry and this accounts for the greater efficiency shown by them. The acreage devoted to the various crops is as follows: Oats 50, rye and vetch 62, corn 45, silage 38, cotton 24, peas and sorghum 65, making a total of 284 acres in cultivation.

A new wing 150 feet long has been added to the main barn. It is well constructed and suits the purpose for which it is intended admirably. It has been erected most economically and will now provide suitable facilities for the housing of beef cattle. A great deal of fencing, terracing, clearing and reclaiming land, and grading have been done. While much remains to be accomplished, in view of the limited funds available and the impaired physical condition of the farm lands which had to be overcome, progress worthy of the highest commendation has been made.

LIVE STOCK.

The College now owns 167 head of live stock, consisting of 10 horses, three of which are registered Percherons, 8 mules, 128 cattle, of which 35 are registered Jerseys, Holsteins and Herefords, and 21 Tamworth and Berkshire hogs, all of which are registered. The sales of live stock should now increase from year to year as the class of animals maintained is superior in all respects to the average of the state. The value of the live stock owned by the College is $12,005.00. The demonstrations made with reference to the possibilities of live stock farming are now attracting state-wide attention, and as a result, many local communities are establishing breeding centers for the encouragement of horse, cattle and hog production. There is a rapidly growing interest in the construction of silos and modern farm barns. There are also marked evidences of a renewed interest in better types of implements because it is recognized that through the breeding of draft horses sufficient power in the collar may be obtained to use modern machinery acceptably. It is also appreciated as never before in the history of Georgia that the lands of the state may be built up more economically and effectively through the utilization of live stock than in any other manner.

POULTRY HUSBANDRY.

The poultry plant has been greatly enlarged, the acquirement of the Church property making this possible. The site selected is undoubtedly the most desirable one available on the College property. Several buildings which occupied the ground had to be moved to new locations entailing considerable expense. All of them have been repaired and painted and put in first-class condition and add much to the attractiveness of the situation. In addition, brooder houses and yards have been constructed, the grounds graded and some planting done. The need of securing the Mack property for the enlargement of the grounds is as essential as ever, and I respectfully urge that this purchase be made at the earliest possible moment. The poultry department is being equipped and maintained as a poultry farm rather than a place for the breeding of fancy stock. In this way it can undoubtedly serve the poultry interests of the state to the best advantage. Courses of instruction in this subject were offered for the first time and proved quite popular. The value of the grounds, buildings and equipment according to the inventory amounts to $7500.00. This shows that the Board of Trustees properly appreciate the importance of this work and are emphasizing it as completely as the funds at their disposal will permit. A summary of data on file in my office and secured from other states indicates that Georgia is probably doing more along poultry husbandry lines than any other southern state with the possible exception of Mississippi.

THE EXPERIMENTAL FIELD.

Excellent work has been done in this department during the past year. Satisfactory progress in the improvement of corn and cotton has been made; the work with winter cereals and the rotation systems already established have been continued and enlarged. Instructive data relative to the cultivation of alfalfa have been obtained, it being shown that the inoculated and limed plats yielded 1.68 tons per acre from the first cutting; whereas, the plats uninoculated, limed or subsoiled only yielded .48 of a ton. Studies on the influence of floats and acid phosphate, of various nitrogen carriers on corn, and of high and low nitrogen ratios in complete fertilizers have been made with corn and other crops. Results are being accumulated of great importance to the farmers of the state and will soon be published in the form of a bulletin.

The studies with corn reveal the fact that the suckers should not be pulled off prolific types, and that there are wide variations in the utility of strains of the same variety. In the case of strain No. 344, for instance, the main plants produced 54 bushels and the stools 9.5 bushels, or a total of 63.5 bushels per acre. In the case of strain No. 376, the main plants produced 71.1 bushels and the stools 40.8 bushels, making a total of 111.9 bushels per acre.

Sunbeam cotton has been distributed in 71 counties in Georgia, and more than 5000 acres of it will be planted in 1913. This cotton has proven largely resistant to anthracnose which causes a loss amounting to millions of dollars annually. Other cotton hybrids are being developed which offer great promise. The fertilizer and variety tests with cotton have been continued and some very valuable information obtained which has already been printed and distributed in bulletin form. A new barn has been erected for this department which will give it the facilities essential for the proper conduct of investigations with cereals and the storing of the large number of samples of grain, grasses and forage crops which are being studied.

ORCHARDS AND GARDENS.

The College orchards and gardens are in better condition than ever before. Considerable additions have been made to the equipment and that alrady in hand has been kept in an efficient condition. Through the use of heaters the temperature in the orchard was maintained six degrees above that prevailing on the outside, and as a result, an abundant crop of fruit will be harvested. This demonstration in itself should prove of tremendous value to the fruit industry of Georgia, and will enable hortilculturists at a moderate outlay to protect their fruit crop from all save the most severe freezes. The department is giving more attention to truck work than ever before and is now endeavoring to establish coöperative work with several farmers on small areas of land scattered throughout the state which will enable it to make practical demonstrations as to the very substantial profits which may be made from the trucking industry.

THE COLLEGE GROUNDS.

Through the courtesy of the Mayor and Council of Athens, the grading and topsoiling of Cedar street were completed during the year. The Athens Electric Railway Co. have erected a neat station at the juncture of Cedar and Lumpkin streets, and by direction of the trustees a five-foot concrete walk was laid from Lumpkin street to the main building. Walks connecting the other buildings were constructed at the same time. This is one of the most desirable improvements made to the grounds since the organization of the College. Pin oaks have been planted on either side of Cedar street and presently the roadway should be flanked with stately trees. Extensive plantings of shrubbery have been made at a number of points, drains laid and a considerable amount of grading done as well. The campus presents a much more pleasing appearance than ever before and should grow more attractive from year to year.

ADDITIONS TO EQUIPMENT.

The expenditures on equipment account have been quite heavy. This has been necessitated by the rapid growth of the institution along all lines. The completion of the beef wing in connection with the main barn represents an outlay of $3450.00. The hog house used by the veterinary department for the production of serum cost $1200.00. The main building of the poultry department cost

$1600.00, fencing $360.00, and colony houses $312.50. The removal, repairing and painting of the houses which formerly occupied the site of the present poultry plant cost $1857.00. The barn for the department of field experiments cost $1300.00. There was expended on sidewalks account $2312.90. Additions to the library and several laboratories amount to about $4025.10. The expenditures under this head total $17,355.00, exclusive of the indirect contributions received from the City of Athens and the Clarke County Commissioners. This service was certainly worth $2000.00. Conservatism has been exercised in all of these expenditures, and in every instance the College has secured the buildings and equipment at the lowest possible cost as any one will find who attempts to duplicate the work at its original cost.

ACTIVITIES OF THE SEVERAL DEPARTMENTS.

The specialized work carried on by the several departments has now become of such a voluminous nature that it is difficult to do it justice in the condensed form in which it must necessarily be treated.

The department of agronomy has fertilizer test plats in progress on 16 type soils in 14 counties. There are 1000 plats on some 48 acres of land. Ten other areas will be taken on during the present summer. The object of this work is to determine the deficiencies of some of the principal soil types of the state and ascertain how they can be most quickly improved through the use of fertilizers and crop rotations. Corn selection work is in progress in eight counties, oat selection in five counties, while crop improvement associations have been organized in five counties. The head of this department is secretary of the Georgia Breeders' Association.

Arrangements have been made by the department of cotton industry to grow various hybrid cottons developed at the College on the above test plats so that the influence which climate, soil and management exert may be determined. The success attained in the distribution of Sunbeam cotton which is largely resistant to anthracnose has already been mentioned. It promises to be one of the most valuable pieces of constructive work undertaken by the College in the interest of Gorgia agriculture. The head of this department was made an honorary member of the Burroughs Nature Club of America, and is also a member of the University Commission for the study of the southern race question.

The horticultural department is studying the rosette of the pecan. This is a destructive disease and threatens the welfare of this important industry. It will take several years to secure definite results. Sufficient work has been done already to show that the remedies generally recommended are ineffective. This department has fertilizer tests in progress in north Georgia with apples, and has already demonstrated the necessity of using cover crops to prevent erosion in that section of the state. Tests of commercial lime-sulphur have shown that this material varies in strength and that the companies are not giving proper directions with regard to its use. Horticulturists who have followed the advice of the department in this matter secured very gratifying results last year. The department also has important tests in progress in the trucking section of the state. The head of this department is secretary of the State Horticultural Society and a member of the committee of the Society for the Advancement of Horticulture in the United States.

The forestry department is continuing the experiments previously reported on, and has added additional experimental plats for studying the influence of thinning on rate of growth and development of forest areas. A number of timber tracts were examined during the year and advice has been given to many persons relative to the best methods of managing forest areas.

The department of veterinary medicine has manufactured over 230,000 c.c. of serum of which 150,000 c.c. have been distributed. This is enough to treat aproximately 10,000 hogs worth at least $100,000.00 as a good many of them are pure-bred animals. The cost of the serum was about $3000.00, and surely this represents a good investment on the part of the state since at least 90 per cent of the animals in the herds attacked by cholera die. The serum is carefully tested before it is sent out. At present it is sold for 2 cents a c.c., and it is believed the price can be reduced to 1.5 a c.c. When this work was undertaken serum was sold in the state at 4 to 5 cents a c. c. The efficiency of that manufactured by the College is shown by the fact that 92 per cent of the animals owned on 26 farms in which cholera had appeared were protected. The serum is not regarded as a cure for cholera, yet a considerable number of sick animals treated recover. The head of this department is president of the State Veterinary Association and secretary of the Georgia Division of the American Veterinary Medical Association.

The department of agricultural chemistry is continuing the soil survey work in coöperation with the Bureau of Soils of the U. S. Department of Agriculture. The physical-chemical survey of Ben Hill county has been completed and bulletins issued by the Department of Agriculture and the College. These bulletins show the various soil types found, their physical and chemical characteristics, the limiting factors in crop production and the methods by which their yields may be materially increased. During the year Dougherty, Troup, Chattooga and Millen counties have been mapped and 225 samples of soil collected for analysis. The physical survey of Stewart, Jones, Jeff Davis and Tolbert counties will be completed by the first of July. The chemical work naturally requires much more time than the general survey, and it is very desirable that the chemical staff be increased on that account. The work has now progressed sufficiently to show its fundamental relation to the establishment of a permanent type of agriculture in Georgia. The head of this department is secretary of the council of the American Association for the Advancement of Science.

The department of farm mechanics has prepared and distributed a considerable number of blue prints of barns and other farm buildings. Plans for the hog cholera serum barn, the experimental barn, the incubator house and the beef wing of the main barn were prepared and the work of construction supervised by this department. The special type of construction used in these buildings has proven very satisfactory, and its economy is shown by the fact that the cost is about 2.5 cents per cubic foot as compared with 5 cents for the type of construction in general use. The department has made tests and examinations of a considerable variety of implements and has advised with farmers relative to the purchase and use of the same. The head of this department presented a paper before the Graduate School of Agriculture, at Lansing, Mich.

The department of animal husbandry exhibited live stock at a number of the principal fairs in Georgia last fall, illustrating graphically the value of blood in grading up native stock. These exhibits attracted considerable attention and are responsible in a measure for the greater interest now evidenced in pure-bred animals. Some progress has been made in establishing breeding centers, and encouragement has also been lent to the winter feeding of cattle and the erection of silos. The surplus pure-bred live stock sold from the farm and widely distributed throughout the state is exerting a most beneficial effect on live-stock production. Only 1.1 per cent of the farmers of Georgia raise colts at the present time, yet the state spends one million dollars a month for horses and mules. The demonstration work in beef production on waste land is being continued and a number of planters have established herds as a result of information secured at the College. The desirability of encouraging the use of pure-bred sires is illustrated by the record of a registered Jersey cow owned by the College. The gross income from the sale of her products in eleven months was $415.58. The expense for feed and handling was $108.74, leaving a net profit of $306.84, which represents 8 per cent on an investment of $3835.50. Many native cows fail to show a profit for dairy purposes which accounts in a large measure for the failure of the industry to develop as it should. The head of this department is secretary of the Georgia Dairy and Live Stock Association. He presented a paper before the East Tennessee Farmers' Convention, at Knoxville, and the National Swine Breeders' Association, at Chicago.

The various exhibits made by the Department of Poultry Husbandry at the fairs last fall with reference to the proper care, preservation and handling of eggs attracted much attention. The loss to farmers through a failure to properly market their eggs amounts to nearly $700,000.00 annually. The department is thus attacking one of the most important and easily corrected faults of the industry. The work in progress has been organized on the basis of serving the interests of the individual farmer rather than the fancier. This would seem to be a wise and proper course to pursue.

The executive office has performed the various duties incident to the general management and administration of the affairs of the College as affecting instruction, research and student welfare. The institution has now grown to such proportions that these duties are daily becoming more and more exacting. Correspondence with farmers is still carried on largely through this office, thousands of personal letters of advice being written in the course of the year. The proper supervision and direction of the specialized extension work carried on by the several departments and the general direction of the various activities grouped under the head of extension-demonstration work has consumd a great deal of time and energy.

Addresses were prepared and delivered before the following organizations: National Fertilizer Association, Atlantic City, N. J.; Northwestern Bankers' Association, St. Paul, Minn.; Georgia Bankers' Association, Macon, Ga.; American Association of Farmers' Institute Workers, Atlanta; American Association of Secondary Schools, Atlanta; State Farmers' Union, Atlanta; Association of American Agricultural Colleges and Experiment Stations, Atlanta; Cotton Seed Crushers' Association, Atlantic Beach, Fla. A paper was also prepared for the American Bankers' Association which met at Detroit, Mich. Numerous addresses have been made at school fairs, gatherings of farmers and before commercial and industrial bodies. I have the honor to be vice-president of the Association of American Agricultural Colleges and Experiment Stations. As heretofore, numerous articles for papers of local, state and national circulation have been prepared with the idea of placing the work of the College and the resources and possibilites of Georgia before the people of the state and nation in an acceptable form.

NEEDS OF THE COLLEGE.

The needs of the College are more pressing at the present time than at any other period during its history. Class rooms and laboratories are overcrowded in many instances, making the sectioning of classes essential and the immediate purchase of a considerable amount of additional equipment imperative. Many of the professors are entitled to a raise in salary and there are not funds in hand to meet this need. The numerous offers which have been made to the members of the staff is the best evidence of their efficiency and indicates that their work has attracted attention elsewhere.

Among the immediate needs is a substantial increase in maintenance for reasons which are obvious. It is essential that greenhouse facilities be provided, that a stock judging pavilion be erected, that additions be made to the shop building, while greater storage facilities for crops and the housing of live stock, and the erection of additional cottages for farm laborers are matters of the most pressing importance. The poultry department in order to do effective work must have a larger area of land at its disposal, and it is desirable that the Mack property and that adjoining it be purchased and turned over to this department as soon as possible. The extension work to be carried on successfully in the future requires greatly increased appropriations for its support. Georgia has ninety million dollars invested in live stock and is spending considerable sums to eradicate the cattle tick. It is very desirable that a degree course in veterinary medicine be established at the earliest possible moment. The demand for instruction along this line is constantly increasing.

To relieve the present situation and take care of the rapidly growing student body and the extension-demonstration work entrusted to its charge the College must have the following appropriations. The facts recited in this report make further comment unnecessary. The records made along all lines are unique in the history of agricultural education in the south.

Increase in maintenance from $60,000.00 to $85,000.00. Of this amount $10,000.00 is to be used for establishing a degree course in veterinary medicine, and $15,000.00 to provide additional equipment and facilities, employ tutors and instructors where needed, and provide for the many contingent expenses which an institution of this character has to meet on account of its exceptional growth.

Increase in extension appropriations from $40,000.00 to $85,000.00. Of this amount $20,000.00 is to be used for boys' and girls' clubs and demonstration work; $10,000.00 for soil surveys; $5000.00 for the establishment of live stock breeding centers; $5000.00 for teachers' training courses in elementary agriculture, and $5000.00 for poultry husbandry.

If the money sought for extension work is obtained funds equivalent to between $55,000.00 and $60,000.00 will be secured from federal and other sources for the furtherance of this work. If the appropriations are not obtained a good part of this money will go to states willing to appropriate money on the basis of dollar for dollar.

Naturally, it is essential that the appropriation of $2500.00 made for several years past for the holding of farmers' institutes, and the $3000.00 appropriation for the manufacture of hog cholera serum be continued.

The income of Georgia is not far from $6,000,000 annually. The College seeks $175,500.00 for maintenance and extension work. This is a little less than one-thirtieth of the state's total revenue and surely is a reasonable amount of the state's income to spend for agricultural development.

It is incumbent upon your Honorable Body to ask for $100,000.00 for another building. The necessity of more room in many of the departments is apparent to any one who reflects for a moment on the remarkable increase in attendance. The present plant was built to care for 200 students. The College has only one academic building. We can not permit boys to be turned away from its doors who seek an agricultural education.

To some these requests may appear large, but they have not studied the situation carefully nor do they realize that the College now has the state of Georgia for a campus. As compared with the appropriations made for agricultural education, research and extension teaching in other states, the appropriations sought are insignificant. Minnesota, for instance, has appropriated $1,800,000.00. Other states are doing proportionately well as the following table shows:

State	Amount Appropriated	Number Students	Value Agricultural Bldgs.
Michigan	$380,513.29	661	$791,500.00
Illinois	329,440.00	830	448,000.00
Wisconsin	421,916.00	609	625,149.00
Georgia	105,500.00	348	188,407.00

The report of the General Assembly committee on the University of Georgia, says: "We next visited the State Agricultural College to which we appropriated $100,000.00 for its support at our last session. After investigating the work which is being done at this branch, we are thoroughly convinced this is a wise expenditure. Agriculture is the principal industry of our state and the main source from which our material prosperity must come. Experience has clearly demonstrated the value of agricultural education in permanently improving the soil, multiplying its yield, and increasing the value of its products. Sincere, enthusiastic interest prevails throughout the state in the achievements here made and instruction here furnished. Too much can not be said in commendation of this great school."

The College is only seeking for $175,500.00 a year, or an increase of $70,000.00 over the appropriations of 1912 and 1913. Surely the institution has demonstrated its efficiency, its power for service and has paid back to the state $1000.00 for every one invested in it.

It is desirable that the law be amended governing the ordinary's office in the several counties so that he may be authorized to sign binding contracts with the College relative to the maintenance of coöperative test plats which are now being established throughout the state. Under existing conditions this work may be jeopardized at any time by the whim of an individual or because of the transfer of the office to one unacquainted with the value of the work in progress.

INVENTORY.

The inventory for 1913 is presented for your information:

Land, 830 acres	$166,000.00
Main building	135,000.00
Houses on College property	4,000.00
Power house, including installation of heating plant, light, water, plumbing, sewage, gas, etc.	35,000.00
Department of agronomy, including barns and demonstration field equipment	11,464.00
Photographic room	509.45
Department of forestry, including Lumpkin Hall	10,966.30
Department of cotton industry	3,000.00
Department of horticulture, including barns, grounds and all other equipment	11,348.38
Extension equipment and exhibit cases	2,746.60
Department of agricultural chemistry, including soil laboratory	6,140.45
Library and seminar room	4,877.46
Department of farm mechanics, including new laboratory	9,947.05

Department of veterinary medicine, including hospital and serum laboratory equipment	10,880.05
Department of poultry husbandry, including new buildings	7,440.00
Department of animal husbandry, including dairy equipment	2,499.50
Live stock on College farm	12,005.00
Buildings, barns and tenant houses	13,747.40
Tools and implements, etc.	2,929.00
Total	$450,500.64

The total value of the property is approximately $450,500.64, the enhancement for the year being $41,723.17, which shows that your Honorable Board has exercised good judgment in the management of the affairs of the College. Of course, a considerable part of this increase is due to the listing of houses and other property unintentionally omitted in the report of 1912. The accumulation of this property in a period of six years and without special appropriations save for maintenance, except in the instance of the main building, constitutes a splendid record. You will observe that the buildings owned by the College are now worth approximately $188,407.00; the land $166,000.00; and the live stock, farm buildings and equipment, $28,681.40. There has been a marked increase in the value of the scientific apparatus, which including the general equipment available for instruction and research is worth $67,412.24.

STUDENT INTERESTS.

The student body has enjoyed good health and the attention to duty has been very gratifying. There has been some tendency for men to enter the one-year course whose purpose in life did not seem to be definitely fixed, and who probably were not seriously interested in agriculture. On this account it seemed advisable to raise the age of entrance to 18 years, and to require as a minimum three months of actual experience on the farm as a prerequisite to entrance. It is believed that these regulations will exercise a wholesome effect, and will not debar any worthy student, while excluding any who may desire to pass themselves off as university students for the time being. The self-help committee of the faculty has given every aid within its power to finding remunerative employment for students who are forced to earn a part of their expenses while in College. The proportion of men who find it necessary to do this is surprisingly large. Encouragement has also been given to the Agricultural and Engineering Clubs. The Agricultural Quarterly has been handled in an advantageous manner and is a creditable student publication. Our professors have acted as advisers to the student body, and though this is a laborious and exacting duty, it has been cheerfully discharged. The annual reception tendered the students by the faculty of the College of Agriculture was a delightful affair and has done much to foster friendly relations between teacher and pupil. Sanitary lavatories and excellent bathing facilities have been provided for the students, and in the future as in the past every effort will be made to look after their best interests and welfare.

THE NEED OF FARM CONSERVATION.

Emerson has aptly said, "The first farmer was the first man, and all nobility rests on the possession and use of land." If he could witness conditions as they exist today, he would no doubt add, "the **intelligent** use of land." Statistics show, for instance, that there are 92.6 acres in the average Georgia farm, and that from 1 to 1.5 animals are available for the cultivation of this land. The expenditures for labor in the last decade increased 82.5 per cent, for machinery 113.7 per cent, for fertilizers 193.6 per cent. There were $72.00 worth of machinery on each farm where there should have been between $700.00 and $800.00. As a result, the yield of corn, cotton and all other farm crops is extremely low. The experiments made at the College and at many points throughout the state show that the yields can be greatly increased at a reasonable cost and our system of farming placed on a permanent basis. There is much diversity of opinion as to how this shall be done, and there is a fear in some quarters that education is to be materialized, culture neglected, and the proper training of statesmen, warriors and jurists overlooked. Since true education is for service in its broadest and most comprehensive sense, how can it be possible that the training of the boys and girls of Georgia to grow some of nature's greatest crops with success can do anything but broaden their perception of life, give vigor to their bodies, character and force to their minds, the power of achievement to their intellects, and the ability to overcome and surmount the obstacles which held back their forbears? It is absurd, yes ridiculous, to believe that mean thoughts, narrow and selfish actions, stunted imaginations and moral degradation find companionship with blue skies, bright sunshine, singing birds, fragrant flowers, pure life-giving breezes and the mysterious activities of nature in her wonderful evolutionary work of combining air, sunshine, water and soil in that marvelous type of alchemy which results in growth, life and an abundant harvest for the skilled agriculturist.

Let us so organize, maintain, equip and direct our institutions from the primary school to the post-graduate courses in our universities as to more completely meet the needs of the day and generation in which we live. To accomplish this all forms of applied education must be emphasized though not to the neglect or exclusion of other types. At the present time seven-tenths of the people of Georgia are engaged in agricultural pursuits. Some forty graduates have been sent out by the College of Agriculture since its reorganization. According to Dr. R. P. Stephens there have been educated for the remaining three-tenths 94 Bachelors of Philosophy, over 500 Bachelors of Science, 1000 lawyers, and 1750 Bachelors of Art. Judged by these figures, materialism is not likely to overtake us for some time to come. It is easily possible to double, treble or even quadruple the yield of crops obtained on most of our lands. If this were done, who could estimate the value of the service to the state? Who can foretell what an effect this would exert on all lines of industry? Those who are afraid of materialism seem to forget that art, culture and refinement have come with an increase of wealth. We may be able to despise money as an abstract thing, but to accomplish the concrete and desirable along intellectual, moral and religious lines, it is the most necessary and essential of all evils. We must not debase applied education too completely for it holds within its grasp the means by which we are to secure the permanent things which make life most desirable and worth while.

CONCLUSION.

The facts recorded in these pages show that the year has been one of substantial progress along all lines. The students have done effective work; the faculty has been loyal and faithful to the exacting duties imposed upon it. The material equipment and general character of the instructional work have been greatly improved. The extension department has rendered more efficient service than ever before. Hundreds of letters of commendation have been received from every class of citizens in every section of the state. The growth in correspondence has entailed additional burdens but at the same time evidences great confidence in the advice which the College offers. While it has been impossible to meet many of the calls for assistance which have come from both individuals and communities, there is no doubt but that there has been a substantial growth in public appreciation of the essential character of scientific training in agriculture. The institution stands now at the parting of the ways. Its future would seem to be bright with promise. Its development will depend largely on the support it can win from the state for its work. Your counsel, wisdom and advice are more urgently needed now than ever before.

In conclusion, I desire to express my appreciation to the faculty and student body for the coöperation they have extended me in all matters affecting the welfare of the College. It is a pleasure to work in association with men of high purpose and sincere devotion to duty, and whose chief enjoyment lies in the successful promotion of the specialized work in their immediate charge.

As in the past, I have enjoyed the mature wisdom, wise counsel and advice of the Chancellor of the University. Many important questions naturally arise in the administration of an institution which has to deal with thousands of people in the course of a year. In every instance the sympathy and firm support of the Chancellor has been accorded me. His consecration to duty and his high ideals have been an inspiration at all times. One must indeed count himself fortunate who is permitted to associate with a man of such splendid vision and such a wholesome outlook upon life.

As a Board of Trustees, you have encouraged and supported me at all times and the large faith which you have evidenced has been a stimulus which no other policy would have offered. Realizing your deep personal sympathy, your earnestness of purpose and your broad patriotism, I have done the best I could under the circumstances to prove faithful to the trust encharged to my care, and I desire now to thank you for your evidences of appreciation, and to express the hope that I may continue to merit your confidence.

Very respectfully,
ANDREW M. SOULE,
President.
May 30th, 1913.

REPORT OF BOARD OF VISITORS.

The Board does not wish to go on record as favoring any school or department of the University as against any other department, but for the reason that Georgia at this particular time, stands so greatly in need of the full development of the agricultural resources of the state and for the additional reason that the state was so tardy in beginning the teaching of practical and theoretical agriculture, we deem it the part of wisdom that the Trustees urge upon the Legislature the necessity of supporting the College of Agriculture in every way possible. We would that every citizen of the state could and would read the report of President Soule for the year just closing.

President Soule asks for an increase in maintenance of $25,000; he asks for an increase of $45,000 to be used in extension work; he presses his claim for $10,000 to be used in the erection of a new building to enable the youth of Georgia to come to this great institution, founded it is true, through the inspiration and the vision caught by the citizens of a distant state, but which some of our people have been wise enough to appropriate and utilize. Gentlemen of the Board of Trustees, urge the legislature to give him every dollar that he asks. It will pay the state from every stand-point. Georgia has been tardy in paying the debt that she owes her sons of the soil. For generations they have paid to the state the larger portion of the taxes that have flowed into her treasury. Georgia is but discharging a debt that she owes these men when she makes large appropriations for the advancement of agriculture. Georgia is an agricultural state. If she is ever rich and truly prosperous, she must become so because of the scientific development of her farming interests; Georgia has many charitable and educational institutions to support and advance. It is the candid opinion of the Board of Visitors that the best, yea, the only way to maintain these institutions is by encouraging the work of the Agricultural College to such an extent that there shall be no farmer throughout our state who does not come within the sphere of its influence, and who fails to realize that his vocation is as honorable, as greatly respected and as remunerative as are those of professional and commercial life.

Respectfully submitted,

A. W. VAN HOOSE, Chm. Board Visitors,
A. HOMER CARMICHAEL, Secretary,
B. W. HUNT,
RALPH NEWTON,
S. B. BREWTON.

RESOLUTION FARMERS' UNION.

Resolved by the Georgia Division of the Farmers' Educative and Coöperative Union of America, in Convention assembled,

First: That we endorse and approve the splendid work that is being done by our State College of Agriculture for the benefit of the farmers, their wives, sons and daughters, in making plain the ways that lead to more successful and profitable operation of all the activities and industries that engage the time and attention of the farmer and his family.

Second: That we approve not only the direct teaching that is done in the class rooms of the College for the student body there, but we also heartily endorse the very useful work that has been undertaken by the College of carrying to thousands of farmers all over the state the more salient and practical agricultural facts through the medium of Farmers' Institutes, Extension Schools, Boys' Corn Clubs, Girls' Canning Clubs, Farm Demonstration Work, Soil Analyses, Demonstration Farms, correspondence with farmers, and other agencies and activities that give helpful direction and assistance to those who till the soil.

Third: That we respectfully and earnestly urge upon their Excellencies, Gov. Joseph M. Brown and Gov.-Elect John M. Slaton, that they present this subject with force and emphasis to the Legislature that is soon to assemble, and recommend to that body that the request of the Board of Trustees of the College of Agriculture, for an increased appropriation for that institution be granted.

Fourth: That a committee be appointed by this body to wait upon their Excellencies in person, and present these resolutions, and that copies of the same be mailed to the address of every member of the Gneral Assembly.

EXTRACT FROM MEMORIAL ON AGRICULTURAL EDUCATION, ADOPTED BY RICHMOND COUNTY AGRICULTURAL CLUB.

Resolved, That we, the members of the Richmond County Agricultural Club (150) endorse the great work which is being done through the State College of Agriculture, at Athens, Ga., not only in the matter of instruction to the students in attendance there, but for the very remarkable and efficient service it is rendering the farmers of the state through its extension-demonstration department.

We find that the revenue of Georgia is something over $6,000,000 annually, and that now about $105,000 are appropriated to the College of Agriculture. We ask that the sum of $100,000 be appropriated for another building at Athens, and the revenues of the College be increased by at least $100,000 annually so that $100,000 may be available for instructional work in agriculture, and $100,000 available for extension-demonstration teaching. We are informed that if the increase is provided that the state will secure about $90,000 annually chiefly from Federal appropriations. If this increase is withheld, the young men of Georgia must be turned away from the doors of the College at Athens; the extension-demonstration work crippled, and the funds appropriated by the Federal government go to other states willing to make the necessary appropriations. Surely, one-thirtieth of the state's revenue is a small proportion of its resources to expend for the promotion of Georgia's primary industry—agriculture.

RESOLUTIONS UNANIMOUSLY PASSED BY

Georgia Dairy and Live Stock Association,
Georgia State Horticultural Society,
Georgia Breeders Association.
Jan. 16—17, 1913.

Resolved, That we hereby petition the General Assembly of Georgia to provide the most liberal appropriations for the Georgia State College of Agriculture, Athens, Georgia. Authentic reports prove that during the last five years, the activities of the College of Agriculture have materially increased the yield and production of our principal crops. The State College of Agriculture needs liberal financial assistance to erect additional buildings, maintain and expand its courses of instruction, and develop its extension-demonstration work; which includes farmers' institutes, agricultural extension schools, teachers' institutes, boys' and girls' clubs, farm demonstrations, soil surveys, fertilizer test plats, horticultural investigations, plant and animal breeding centers, field work in live stock and dairying, and poultry husbandry.

The General Assembly of Georgia should in our judgment appropriate a much larger proportion of the state's revenues to the advancement of our agricultural interests now being so ably promoted by the State College of Agriculture. Your favorable support of this request will meet with the hearty approval of your constituents.

RESOLUTIONS OF T. P. A. OF GEORGIA.

Be it Resolved, That since the welfare of business in Georgia and, therefore, the welfare of the traveling man, is largely dependent upon the success of agriculture, we heartily approve of every effort being put forth for its improvement.

Recognizing the great work being accomplished by the Georgia State College of Agriculture in boys' corn club and girls' canning club work, in farm demonstration work of agents scattered throughout the state, in the holding of farmers' schools and institutes and other methods used for the dissemination of agricultural information, as well as the training of skilled men at the College itself, we express our hearty approval, offer our influence and respectfully petition the legislature to liberally provide for all such work.

C
G296u2a-C
1913/14

UNIVERSITY OF ILLINOIS LIBRARY
MAR 6 1917

Annual Report of the President

Georgia State College of Agriculture and the Mechanic Arts

UNIVERSITAS GEORGIAE
ET DOCERE ET RERUM EXQUIRERE CAUSAS
1785

—TO—

BOARD OF TRUSTEES

Georgia State College of Agriculture

JUNE, 1914

UNIVERSITY OF ILLINOIS LIBRARY

MAR 6 1917

Report of the President, State College of Agriculture and the Mechanic Arts

---

To the Honorable Board of Trustees
of the University of Georgia
and the Georgia State College of Agriculture.

Gentlemen:—An institution with "a state for a campus" has many problems to solve. If it fulfills its destiny in a commonwealth with such a large rural population as Georgia, it is expected to radiate from the center to the circumference and to in some measure influence the welfare of eighty per cent of the population. Undismayed by the prodigious nature of the task, even though crippled financially, the Georgia State College of Agriculture and the Mechanic Arts has made substantial progress during the collegiate year, 1913-1914. The record of the year is submitted for your information that you may adequately judge of the value and merit of the work accomplished, and determine whether or not this has been a year of the greatest progress and success yet attained.

Record of Attendance.

You will be gratified to observe the increased attendance recorded, evidencing thereby a measure of the appreciation and esteem in which the institution is held. The total number of students enrolled was 628 of which 162 were in the College of Science and Engineering and 466 in the College of Agriculture. The decrease in attendance in the College of Science and Engineering is difficult to account for. Probably the modification made in the Bachelor of Science degree for the purpose of more completely professionalizing it, accounts for it in some measure.

The attendance upon the degree courses in the College of Agriculture continues to merit attention, 130 men being enrolled in the degree courses while several of those classed as special students are only slightly irregular and will presently place themselves in line for a degree. There was some falling off in attendance upon the one-year course due to the raising of the age of entrance to eighteen years and requiring practical experience on a farm before coming to the College. The men enrolled in this course have made a fine record, and the wisdom of the Board and faculty in making the changes indicated has been fully demonstrated.

The attendance upon the short courses has surpassed all previous records. Eighty-eight adult farmers were enrolled. A special course was provided for the 54 demonstration agents. Eighteen persons attended the summer cotton-grading course. 106 corn club boys and 37 canning club girls and teachers attended the special courses offered for them. The increase over the preceding year in all courses was 116, and in the short courses 119. If the interest evidenced at the present time may be taken as a safe criterion, a substantial increase in all courses may be anticipated for 1914-1915.

Student Enrollment During Past Seven Years.

Year	Long Courses	Short Courses	Total
1908	67	104	171
1909	62	124	186
1910	98	100	198
1911	115	110	225
1912	161	66	227
1913	185	165	350
1914	182	284	466
Total	870	953	1823

Increase in short courses in seven years,	174 per cent.
Increase in degree courses in seven years	172 per cent.
Increase in all courses in seven years	172 per cent.

Graduates.

Graduates represent the transformed energy of an institution. Their virility and forcefulness may be taken as a measure of its efficiency. The record of those who have gone out from the College will bear your closest scrutiny and will fill your heart with pardonable pride. The College reports the largest graduating class in its history, and most of these young men have already determined upon the line of work they will pursue upon receipt of their diplomas. You will be glad to know that a fair percentage of them will return to the farm and that practically all of them will be engaged in the upbuilding of the agricultural interests of Georgia. The state needs approximately 35,350 trained men to direct the operations on its 291,000 farms. To some this will no doubt smack of the chimerical, but an analysis of the situation will reveal the conservativeness of this statement. Georgia needs 15,000 expert live-stock men, 10,000 trained orchardists and truck growers, 5,000 expert dairymen, 500 agricultural engineers, 500 teachers of chemistry in its relation to farm practice, 2,500 agricultural science teachers, 600 instructors in manual training as regards the use of labor-saving devices, 600 veterinarians and traveling inspectors, 150 investigators, 300 men and women to act as county agents and 200 foresters. The Smith-Lever Bill calls for the immediate preparation of several hundred men that Georgia may enjoy and profit by the advantages this measure will confer. A distinguished American said recently that in view of the economic situation now confronting us, the future development of the country rests essentially on what the agricultural colleges will be able to accomplish. Certainly, if additional wealth is not to be attained through the acquirement of new territory, it must be developed by transforming our latent soil resources into productiveness. There never has been a time in the history of the world when the opportunities for service and achievements along agricultural lines have promised so great a reward to young men as now.

Continuation Courses.

The situation revealed in the previous paragraphs illustrates why every young man should be encouraged to continue his studies and obtain a master's or doctor's degree in agriculture. To this end one or more scholarships should be provided for each department of college work, since many of the boys who desire to perfect themselves as investigators or teachers are unable to take up advanced courses without financial aid. The issues involved are so extensive that the state should not hesitate to appropriate a few thousand dollars, not only for the maintenance of courses leading to the master's degree in agriculture, but to the doctor's degree as well. There is no well-founded reason why, with proper additions to the equipment of the laboratories and the library, a doctor's degree should not be offered. Numerous problems requiring immediate attention might with propriety constitute the basis of work for a doctor's degree, and at the same time reveal information of the most substantial value to the people of Georgia. I trust, therefore, that your interest and sympathies may center in this matter to the end that adequate provision may be made for the same at no distant date. Naturally, these degrees should be so safeguarded as to insure national recognition of the men receiving them.

Professors' Reports.

All of the professors have prepared and submitted reports for your information. These reports will no doubt receive your careful consideration. They reveal an activity on the part of the several departments which will doubtless win your approval. In an institution of this type professors are called upon for an unusually large number of hours of work, and serve such a variety of interests that their duties at times become perplexing and difficult to fulfill with complacency. In spite of this condition, however, the faculty has gone systematically forward with its work and has discharged its duties in a highly satisfactory manner. You will be gratified to know that the representatives of the several departments continue to win encomiums from the people of the state for the good work they have done, and for the interest they have taken in the welfare of all, even to the least conspicuous citizen. They have exemplified very beautifully the motto of the institution: "To Do Something for Every One." I desire to say in this connection that the faculty has shown a degree of loyalty and consideration which has alone made possible the development of the institution to its present status.

Changes in Personnel.

Comparatively few changes have taken place in the staff during the year now closing which is very fortunate indeed for reasons which are obvious. As in the past some of our most valuable men have received flattering offers to go elsewhere, and it is a source of great gratification that they have decided to remain with us. Under the circumstances it is hoped that the state of Georgia will shortly increase appropriations to the end that the salaries of these faithful public servants may be raised to a degree commensurate with the opportunities they might enjoy elsewhere.

C. M. Kiger, B.S.A., M.S., University of Georgia, tutor in horticulture, resigned September 1st, to return to the farm. As you recall, he received his master's degree in agriculture from this institution last June.

H. B. Carpenter, B.S.A., University of Missouri, instructor in animal husbandry, resigned on October 1st to accept an advanced position in the University of Nebraska.

John L. Bishop, B.S., M.S., University of Wisconsin, resigned January 1st to engage in dairy farming in Virginia.

Miss Mary E. Creswell, in charge of Girls' Canning Clubs, resigned January 1st to go to Washington as supervisor of girls' clubs for the southern states, at a substantial increase in salary.

J. Wm. Hart, field agent in dairying, resigned May 25th, to take up the supervision of the Jekyl Island at an increased salary.

R. E. Blackburn, B.S., University of Illinois, was appointed tutor in agronomy effective September 1st. He is also studying for the master's degree.

Lloyd Worrall, B.S.A., University of Georgia, was appointed tutor in agronomy effective September 1st. He is studying for the master's degree.

O. T. Goodwin, B.S., University of Michigan, was appointed instructor in animal husbandry, effective October 1st.

James E. Downing took charge of the Pig Club work on September 1st. This work is carried on in coöperation with the U. S. Department of Agriculture.

Miss Elizabeth G. Holt was appointed instructor in charge of girls' clubs on January 1st.

The following men have acted in the capacity of student assistants during the year: Elmo Ragsdale, L. G. Proctor and L. R. Smith.

College of Science and Engineering.

Increased maintenance is essential for the College of Science and Engineering. Courses of this character can not be given satisfactorily except in properly equipped and maintained laboratories. Scientifically and technically trained men are expected to compete on graduation with mature and experienced workers in many lines of industry. Men who have been theoretically schooled while in College, but not adequately trained through laboratory courses often find themselves handicapped on this account when entering upon their life work. Deficient equipment, therefore, reacts on the graduate and the teacher and retards research. Of course, good buildings are essential, and certainly the College of Science and Engineering should have an adequate work shop for student instruction. But in the mean time an appropriation of $10,000 a year would add so materially to the facilities as to permit in large measure the reorganization of the more important courses. It is to be hoped, therefore, that the legislature will recognize this need and make immediate provision therefor.

Library.

A good library constitutes one of the most important laboratories in any technical institution. Books when properly used become most effective tools in the process of intellectual development. Wherever professional courses are offered, special library facilities must be developed, and you have wisely made fairly liberal provision for this purpose. The library now contains 2506 books and over 10,000 reports and pamphlets; 175 daily and weekly newspapers are received regularly and 150 agricultural papers. A selected list of magazines is also subscribed for. The library and reading room are thus fairly well provided with literature of both a technical and non-technical character. The systematized library work required of the students by the professors has resulted in seriously overcrowding the reading room. Floor space for shelving the books, bulletins and periodicals is now fully occupied. The problem of providing room for additional books has already become serious. No additional space is available for a reading room, and the present outlook for the development of the library is not encouraging. The various duties which the librarian is expected to perform in the capacity of editor-librarian also seem to indicate the wisdom of appointing a cataloguer. Since the library is of such primary importance to every student and professor, I am sure the necessity for enlarging its uesfulness through the provision of additional space and assistants for its more effective organization will meet with your favorable consideration.

Editor.

The editor has had a busy and successful year. The preparation and distribution of free plate matter has met with a hearty response on the part of the editors of the weekly press of the state. About 200 columns per week of matter has been published during the past six months. This service would be used regularly for the entire year if sufficient funds were available to send it out. Our correspondence shows that the great mass of farmers in Georgia are reading this plate matter and the institution has been enabled by this plan to provide the best possible information along agricultural lines at a minimum of cost to the people of the state. The demand for this plate service is such at the present time that it seems reasonable to expect the legislature to appropriate funds to enable its systematic and general use, especially in view of the unanimous endorsement given this service by the Georgia Weekly Press Association at its annual meeting at LaGrange. This feature of the College work has attracted wide-spread attention and numerous inquiries have been received by the editor from other colleges concerning the methods pursued here in Georgia. In this connection it is well to remember that the editor has been active in supplying news items to the daily press, and that these are appreciated is shown by their extensive use. Not a single unfriendly editorial has appeared in either the weekly or daily papers concerning the College, while many commendatory ones have been observed. It is believed that in the press service the institution is offering effective advice to farmers and rendering a service of great value to the state.

Short Courses for Boys and Girls.

The short courses for boys and girls were well attended, thus demonstrating the wisdom of the Board in establishing work of this character. 106 boys enrolled in the special short course provided for them, and 37 girls and teachers in the course organized for the winners in the canning club contests. All of these young people came to the College as the result of winning scholarships, the value of each being $25.00 or more. It will thus be seen that the people of Georgia contributed several thousand dollars towards the furtherance of this work, which shows that it appealed to them strongly and that they believe the institution is acting wisely in offering these picked boys and girls a better vision of what they may expect to accomplish in life through the proper training of their intellects. The interest and courtesy of these young men and women impressed every one with whom they came in contact. Many of them expressed the intention of returning to the College for further training, and a number of those who attended previous courses are already known to have enrolled in the district schools or to be in attendance upon one of the normal schools. Thus, if these courses did nothing more than to stimulate the ambition of these boys and girls, they would have fulfilled a mission well worth while. As a matter of fact, correspondence shows that they appreciated thoroughly the instruction offered and have carried back to their homes many truths which they are now actively putting into practice and which will redound to their advantage. The good people who contributed these scholarships will no doubt be accorded your sincere thanks for they have added very considerably to the constructive work of the College. You will also be glad to know that nearly twice as many scholarships have been provided for next winter as were available the past year. It has been found that it is difficult to pay railroad fare and maintain a boy or girl for two weeks in Athens at a cost of $25.00, and on this account our friends have been asked to increase the amount of the scholarships to $30.00 or $35.00. This has been cheerfully done in all instances. There is reason to believe that 200 scholarships will be offered for 1915.

The Farmers' Conference.

The usual farmers' conference in connection with the annual meeting of the Georgia Dairy and Live Stock Association, the Georgia Breeders' Association and the State Horticultural Society was held at the College in January. These meetings were so arranged as to permit the county demonstration agents and the boys and girls and adult farmers present to hear addresess by eminent specialists brought here for the occasion from various parts of the United States. Mr. Joseph E. Wing, of Ohio, gave several lectures on alfalfa. The U. S. Department of Agriculture through the courtesy of the Secretary was kind enough to delegate several of its representative men to deliver addresses. The Hon. Bradford Knapp was present with other representatives of his office and added much to the profitable nature of the conference. Prof. Jarnagin is secretary of the Dairy and Live Stock Association, Prof. McHatton of the State Horticultural Society, and Professor Fain of the Georgia Breeders' Association. These men have performed onerous and exacting duties in the furtherance of the work of these organizations. We are indebted to friends in the city of Athens for funds with which a buffet luncheon was given visitors to the conference. The lunch was prepared by the canning club girls under the supervision of Miss Holt. The occasion was a most pleasant one. The interest in these meetings is evidenced by the presence of nearly 500 persons.

District Agricultural Schools.

The third annual meeting of the principals of the district agricultural schools of Georgia was held in my office on Monday, April 20th. There was a very good attendance and a harmonious and profitable meeting. A few minor changes were suggested in the course of study in the belief that recently published text books would prove more acceptable. The principals asked the coöperation of the College in averting the passage of a measure now pending before the legislature which proposes to give $6,000 to each of the schools and prorate the balance of the present annual appropriation of $10,000 on the basis of attendance. Since the schools were not equally well endowed and provided with buildings and equipment, and some were located in less favored situations than others or had to contend with well established local schools, it would appear that the passage of this measure at the present time is inadvisable. As a matter of fact, the attendance upon all the schools is better than ever before in their history, and instead of lessening the annual appropriation of these institutions, the amount for each should be increased $2,000 a year so that better laboratory facilities and equipment can be provided. Prof. Stewart has examined the schools and has prepared the annual report concerning their work which is printed and distributed as a College bulletin by your direction.

During the conference attention was called to the law governing the organization of the schools and the relation which the University bears to them. The principals were informed that the annual meeting was called at the direction of both the General Board of the University of Georgia and the Board of Trustees of the Georgia State College of Agriculture, and that the annual report dealing with the schools and published by direction of the Trustees was similar in character to the reports prepared by the administrative officers of the University and transmitted by the President of the General Board of Trustees to the legislature for its information. Attention was called to the fact that while the schools taught no languages, provision for making up the necessary units in these subjects has been made in the University, and that the entrance standard maintained by the College was distinctly in advance of a number of other similar institutions in the south. It was shown that the maintenance of a high standard did not militate against the schools since it required students to spend four full years with them before entering College. For further information concerning the work of the conference and the schools, you are respectfully referred to the Fifth Annual Report of the District Agricultural Schools.

Extension Activities.

The extension department has had a prosperous and successful year. The work summarized in the following table deals with those activities which are conducted through the agency of the offices of the secretary of the extension department and the state agent in charge of demonstration work. Under this head are included extension schools, farmers' institutes, teachers' institutes, corn and canning clubs, farm demonstrations and various miscellaneous meetings.

Kind of Meeting	Number	Counties	Attend'ce	Miles Trav'l'd
Extension schools	7	7	4710	12536
Farmers' institutes	109	109	31778	17274
Teachers' institutes	5	5	650	1475
Miscellaneous meetings	46	37	11859	10527
Exhibit, State Fair, Macon	1	1	50000	800
Exhibit, Ga.-Car. Fair, Augusta	1	1	25000	648
Corn Club and demonstration meetings	643	146	83792	130720
Girls' canning clubs meetings	137	43	10274	14319
Total	949		218063	188299

You will observe that 949 meetings were held, one or more being provided for in practically every county in the state. The attendance by sessions was 218,063, and our extension representatives traveled 188,299 miles. These figures include attendance upon exhibits at the State Fair in Macon and the Georgia-Carolina Fair in Augusta. Farmers' institutes were held in 109 counties with a total attendance of 31,778 which represents an increase of 53 per cent over the previous year. In spite of the splendid showing made, the legislature failed to continue the inadequate appropriation of $2,500 made for a number of years for this work to the General Board of Trustees of the University of Georgia and turned over by them for administration to the Board of Trustees of the Georgia State College of Agriculture. It does not seem possible that the members of the legislature nor the people of Georgia realize the splendid service which has been rendered through farmers' institutes, or they would not only insist upon continuing the appropriation but increasing it to a reasonable amount, say $10,000 a year. To cut off farmers' institutes at a period when our agricultural practice needs to undergo a definite transformation is little short of suicidal, and even though the state treasury may not be in an overflowing condition, there are surely funds enough at the command of a wealthy state like Georgia to maintain a service of this character which has been performed virtually without cost to the state in that our professors have delivered the major part of the lectures, receiving no remuneration therefor beyond their actual traveling expenses. It is believed that this matter will appeal to you as of such importance as to warrant a systematic effort being made to have the legislature reinstate this appropriation at the approaching summer session.

The wording of the appropriation act rendered necessary a change in the method of holding extension schools. Previously the total expense was borne by the College. Since January 1st the communities have been asked to bear half of the cost owing to the reduction in the funds available for traveling expenses. This request was cheerfully met by all of the communities visited, which is the best evidence of the appreciation on the part of the people of work of this character. Seven week-long extension schools were held with a total attendance of 4710 persons. Only a limited number of teachers' institutes have been attended this year, not for lack of interest or demand for assistance, but because of the deficiency in our traveling expense fund. It is believed that no institution can serve the rural teacher more advantageously than the State College of Agriculture, and certainly an amount of sufficient size to send representatives to these meetings upon the request of the state supervisors should be immediately provided.

A New Army of Leaders.

The enrollment in the boys' corn clubs is at present 11,000. There are 3500 girls in the canning clubs and 970 boys in the pig clubs. In fostering the work of the boys' corn and pig clubs and the girls' canning clubs, Georgia is educating a new army of leaders whose example has already borne abundant fruit and will continue to do so in an increasingly effective manner as the years go by. Of the boys enrolled last year over 3000 completed their reports and presented exhibits at the State Corn Show in Atlanta. The average production of corn per acre was 54 bushels at a cost of 46 cents. Observe that this is over three times the average yield obtained in Georgia. Ninety boys made a yield of over 100 bushels per acre. Edward Wellborn, of Madison, Morgan county, won the state premium with a yield of 181.7 bushels. The cost was $54.65 and the profit with corn at $1.00 a bushel, $127.07. To read the record of his achievement is both entertaining and instructive, because it illustrates how the efficiency of our farmers may be increased from ten to twelve times.

Pig clubs have been organized this year for the first time. This work is carried on, as in the case of other forms of club work, in coöperation with the U. S. Department of Agriculture. In this instance it is correlated with the Bureau of Animal Industry. Mr. J. E. Downing is in charge with headquarters at the College. The enrollment noted above is most encouraging.

In the canning clubs, 463 girls completed reports last year. They put up 55,173 No. 3 cans of tomatoes with a monetary value of $12,163.64. Each tenth acre represented an outlay of $11.00, and an average net profit of $23.26. Miss Clyde Sullivan, of Ousley, Lowndes county, was the champion tomato grower of the United States. She raised 5,000 pounds of tomatoes on a tenth acre and put up 1714 No. 3 cans with a total value of $229.26. The cost involved was $96.87, leaving a net profit of $132.39.

Comment on the value and character-forming influences of work of this kind seems unnecessary. That it is destined to add to the efficiency and purposefulness of the boys and girls who engage in these several activities cannot be gainsaid. That it will emphasize the necessity for perseverance, integrity and applied effort and make nobler and better men and women with broader ideas of citizenship and with a higher appreciation of mental attainments is certainly true. To work out in the open and be associated with nature is bound to be wholesome and beneficial. Those who fear materialism should bear in mind that people cannot develop or maintain a high standard of civilization except through the ability to work with the natural resources of the world in an intelligent, conservative and constructive manner.

Demonstration Work.

The demonstration work has made a splendid record during the past year. As previously pointed out, it is conducted in coöperation with the Farmers' Coöperative Demonstration Work of the Bureau of Plant Industry of the U. S. Department of Agriculture. The coördination of this work has been a distinct gain to all the interests concerned. Georgia is credited with having done the most effective work along this line of any of the states. At the present time there are 68 men and 46 women acting as county agents, or a total of 114. These agents are working with 7500 adult demonstrators and also supervising the activities of the boys and girls. In all they have an army of 22,000 individuals under their charge. Sixty-five agents operating in 75 counties last year had 5800 adult demonstrators who devoted 15,000 acres to corn with an average yield of 36.3 bushels per acre. There were 16,000 acres in cotton with a yield of 1303 pounds of seed cotton per acre. The average yield of oats on 4,053 acres was 43 bushels. This does not include the advice and semi-supervision offered to 5,236 men enlisted as coöperators and who were furnished with bulletins and other information. There were 27,500 acres of land planted to winter cover crops last autumn by direction of the county agents. Compare these yields with the average of the state, and it becomes apparent at once that it is easily possible to double and treble the output of farm crops in Georgia at a minimum of cost. To do this, personal work must be instituted through some such medium as the county adviser. This seems to be the most practical plan to follow at the present time, and it is hoped that this service may be rapidly extended with funds available through the Smith-Lever extension bill. The state should make an appropriation of $25,000 a year for its advancement so that an agent may be placed in each county in the shortest possible time. The public appreciation of the county adviser is shown by the contribution on the part of fifty-five Georgia counties of over $25,000 for the maintenance of demonstration agents for the present year.

Publications.

The following bulletins have been issued during the year:

Title	Edition	Pages per copy	Total
Short Courses for Farmers, 1914	7500	12	9000
Poultry on the Farm	12000	32	384000
Hog Raising in the South	15000	24	360000
Butter Making on the Farm	15000	16	240000
Cotton Variety Tests, 1913	10000	8	80000
Vegetable Gardening in Georgia	10000	56	560000
Extension Lecture Courses in Agriculture	1000	20	20000
Farmers' Coöperative Demonstration W'rk	10000	24	240000
Boys' Corn Club Work	12000	24	288000
Special Courses for Boys and Girls	1000	4	4000
Instructions for Girls' Clubs	5000	8	40000
Announcement of Summer School in Cotton Grading	2000	4	8000
Proceedings of the Farmers' Conference	2000	200	200000
Fifth Annual Report of District Agricultural Schools	2000	40	80000
College catalogue, 1914-1915	2000	88	176000
	106500	560	2689000

There are 25,000 names on the mailing list and the demand for publications is steadily increasing. In fact, much dissatisfaction is expressed from time to time by citizens over their inabiltiy to secure information in bulletin form. It would be a comparatively simple matter to prepare, edit and distribute informational bulletins were funds available for their printing and distribution. Since the College was reorganized 76 pamphlets have been issued besides a large number of circulars. There were 747,500 copies of the bulletins printed containing 17,961,000 pages. This would appear to constitute a good record in view of the small amount of money available for work of this chararter.

Srholarships, Prizes and Gifts.

As in previous years, friends of the institution have contributed a number of substantial scholarships and prizes. $500.00 have been received for this purpose from the Virginia-Carolina Chemical Co.; H. G. Hastings & Co. has contributed $270.00; the American Coal Products Co., $15.00; The DeLaval Separator Co., a turbine separator valued at $75.00; the Southern Railway Co., two scholarships valued at $250.00 each; the Georgia Cotton Seed Crushers' Association, $25.00; Hon. Gordon Lee, $100.00. These prizes and scholarships have afforded a number of young men the means with which to pay a part or all of their College expenses, as most of them are awarded for merit in competitive examinations. The Georgia Bankers' Association donated $100.00 to winners in the Corn Club contests. This Association has also contributed several hundred dollars towards the maintenance of the extension work. The Piedmont Lime Co. and the Whitestone Marble Co. have each donated a carload of crushed lime rock, and the Virginia-Carolina Chemical Co., and the American Coal Products Co. have each contributed fertilizers. Other firms have given trees and spray materials to the value of $200.00. Chambers of commerce, boards of trade, county boards of education and individual citizens have contributed scholarships to the various short courses to the value of $2,288.05, making a total of $3973.05 in donations.

Coöperative Relationships.

In accordance with the policy of the Board of Trustees, steady advancement has been made during the year in the coördination of all agencies concerned in agricultural development work. The extension-demonstration work inaugurated with the Bureau of Soils, Animal Industry and Plant Industry of the U. S. Department of Agriculture has been continued without interruption. During the year physical soils surveys of Stewart, Habersham, Jones, Gordon, Jeff Davis, Terrell, Clay, Moultrie, Talbot and Tattnall counties have been finished. Chemical surveys of Chattooga, Stewart, Dougherty and Troup have been completed, and of Jones and Habersham partially completed. Reports of the physical surveys of Chattooga, Gordon, Miller, Troup, Dougherty and Jones have been published. This work is being carried on coöperatively with the Bureau of Soils. Within the past six months over 1700 square miles of territory have been mapped in Terrell, Colquitt, Clay and Tattnall counties. Prof. Long, our field man in charge of this work, is now engaged with Mr. Baldwin of the Bureau of Soils in a survey of Jackson county, and it is hoped that Polk county will be completed during the summer. In all, 5792 square miles have been surveyed in Georgia within the past three years. The record in the direction of acquiring definite information concerning Georgia soil types and phases will no doubt appeal to your pride, and shows that the joint field force is making comparatively rapid progress, considering the small amount of money which the state has set aside for this purpose. Through the liberality of the federal government the physical surveys are being promoted much more rapidly than the chemical surveys. Naturally, the chemical survey is more tedious and costly as well, yet it is necessary to the establishment of a successful permanent system of agriculture in Georgia.

The benefits of the extension-demonstration work carried on with the Bureau of Plant Industry have already been pointed out. The dairy division of the Bureau of Animal Industry with which we are coöperating in the maintenance of a field agent, has aided us in doing effective work for dairymen the past year. Six barns and 18 silos have been built and special service rendered to a large number of dairymen through personal visits and by correspondence. The demand for silos is such that several men could be put in the field to advantage at the present time. Without the silo, beef and dairy enterprises cannot be successfully inaugurated and maintained in Georgia. Both are essential to the welfare of our agriculture, as you fully recognize. The resignation of Prof. J. W. Hart has temporarily interfered with the dairy extension work.

As a result of the coöperative relations existing with the various bureaus enumerated, the State of Georgia and this institution are participating in the expenditure of $60,000 a year for agricultural development work. The institution is also coöperating with the State Department of Agriculture through Commissioner J. D. Price and his assistants. Coöperative agreements have been entered into with the State Board of Entomology with reference to investigations concerning pecans and Irish potatoes. A temporary agreement has also been reached with reference to cotton investigations whereby it is believed the interests of the College, the State Board of Entomology and the Experiment Station will be advanced.

The boys' corn and pig clubs and the girls' canning clubs are carried on in association with the public school system, and I am glad to report that State Superintendent Brittain and his supervisors have aided us materially in the promotion of this work.

The Central of Georgia Railway is continuing its relations with the College with reference to the maintenance of test farms. There are now eighteen of these. The value of work of this character cannot be over-emphasized. These farms vary in size from twenty-five to fifty acres. Last year the eight farms in Georgia made a net profit of $5,217.52, which shows that either the one-horse farmer or the man who operates on a large scale will be materially benefited if he is willing to take advice with reference to improved methods.

The chambers of commerce of Atlanta, Savannah, Macon, Tifton and Columbus have aided in the maintenance of local and district agents for the boys' corn and girls' canning clubs. The Cotton Seed Crushers' Association, the State Fair, local boards of trade, county boards of education and individual citizens have given largely of their means to the support of the various lines of extension work in which the College is concerned.

The counties coöperating in the above enterprises contributed to the demonstration work, as already pointed out, $25,000, and to the canning club work $8,000. Provision has already been made for $15,000 in prizes for boys and $5,000 in prizes for girls. A considerable amount of this fund will be used for scholarships, probably $7,000 being appropriated for this purpose. The chamber of commerce in Atlanta is contributing $1,000 towards the maintenance of a district supervisor, and funds have been received from various other sources to the amount of several hundred dollars. The total funds available for the extension-demonstration work through contributions from the people of the state thus reach the splendid total of $53,000 which is $14,525 in excess of the funds received last year. The interest is greater than in previous years and the work is attracting attention throughout the entire state. Including the funds received from the coöperative agencies and the State, there is now expended for extension-demonstration work in Georgia approximately $96,500 a year exclusive of the funds set aside for prizes. This constitutes a record of development which reflects great credit on the skill with which the Board has directed the extension-demonstration activities of the institution.

The College Farm.

The careful management accorded the College farm is bearing fruit. The receipts for the fiscal year now closing total $10,335.46, an increase of $1,753.93 over the previous year. The sale of dairy products amounted to about $6,036.57, and of farm products including live stock, to $4,298.89. You will recall that when the College was reorganized the farm was leased for $700.00. The receipts for the current year indicate that substantial progress has been made in building up the farm and making it a source of profit and service to the institution. The systematic development of roadways now in progress, as indicated elsewhere, will facilitate its operation, and will also add much to its attractiveness from the standpoint of visitors.

The completion of the beef wing of the cattle barn permitted the proper housing of the Hereford cattle and the conducting of some interesting feeding tests with animals of this class. The centralization of the work stock in the main barn has also been of great advantage and enables operating the farm in a more economic manner than has been possible heretofore. The early completion of the dairy wing will furnish ideal conditions for housing and feeding this class and will enable the enlargement of the herd maintained for dairy purposes. The customary improvements in the way of constructing fences, removing stones and stumps, clearing and reclaiming new ground, and grading and hauling have been made. The completion of a 125-ton silo constructed of metal lath and cement adds much to the storage space and will insure an abundance of succulent food for winter use. The farm has established an area in alfalfa with promising results, and tests in utilizing a mixture of beardless wheat, oats and vetch for pasture and hay purposes have been commenced. This work is of peculiar interest to dairymen because of the serious trouble experienced every spring by reason of the presence of bitter weed in practically all permanent pastures. The consumption of this weed by dairy cows transmits such an objectionable flavor to milk as to render it practically worthless for table use. The acreage devoted to the various crops is as follows: Peas 50 acres; oats 51; oats, wheat and vetch hay 24; rye 23; corn 55; silage 27; and cotton 24, making a total of 254 acres under cultivation.

The reclaiming of additional lands for general cultivation is an essential matter and will be pushed forward as rapidly as possible. An effort will be made during next year to establish a hog ranch on a basis commensurate with the importance of this industry and the needs of the farm. The profit on the farm for the past year is $3,115.61.

Live Stock.

There are 170 head of live stock on the College farm consisting of 19 horses of which three are registered Percherons; 19 pure-bred Jerseys, 16 grade Jerseys, 14 pure-bred Holsteins, 11 grade Holsteins, 2 pure-bred Herefords, 56 grade Herefords, 10 pure-bred Shorthorns, 19 pure-bred Tamworths, and 4 Berkshires. There are thus 71 pure-bred animals representing seven breeds now on the farm. The most note-worthy development of the year is the establishment of a herd of Shorthorns. The interest in beef cattle has grown amazingly within the past few months and the demand for cattle of this class justifies the establishment of a Shorthorn herd for the instruction of students and for the purpose of stimulating the systematic and wise distribution of the breed throughout the state. The total value of the live stock on the farm may now be conservatively stated at $13,580, an increase of $1,577 for the year. The sales of live stock amounted to $2,937.69, and included 22 dairy animals of which 17 were pure-bred, 18 beef cattle, 40 pure-bred pigs, and 5 horses, making the total number of animals sold 85. These animals have been widely distributed throughout the state and are being made the basis wherever possible of community breeding centers with the idea of encouraging the development of one type of animals at certain definite centers. The reasons for this are obvious and need not be enlarged upon.

The present development witnessed along all lines relating to live stock industries is most encouraging for it means that the farmers will be able to prepare and operate their lands more advantageously by reason of the greater efficiency of their work stock, and the state will suffer much less damage from the effects of the boll weevil invasion by reason of the institution of a diversified farm practice which the development of animal industries alone makes feasible and profitable.

Poultry Husbandry.

The poultry plant has been enlarged during the year by the addition of two new laying houses and eight portable colony houses, the fencing in of an increased acreage, and the planting of shade trees. There is urgent need for additional funds for the erection of other buildings and for the acquirement of additional land. Some property adjacent to the poultry plant is owned by negroes and its purchase should be undertaken at the earliest possible moment. Three hundred hens were maintained last year, all raised in incubators. Records were kept of four laying flocks, and next year it is expected that the number of hens will be increased to five hundred.

Thirty-two students received instruction in this department. As part of the work is elective, it shows the growing interest in poultry husbandry and fully justifies the Board in the expenditures made for the establishment of this department. Short courses were offered in January to the boys and girls and adult farmers. The department of poultry husbandry has rendered valuable service to the extension department during the past year, and has undertaken the inauguration of poultry clubs. Six counties have been organized with an enrollment of 89. The development of the department will shortly call for the appointment of an instructor as it is impossible for one man to do the large amount of field work for which there is a constant demand, and supervise the plant and instruct students.

The Experimental Field.

Human progress has been in proportion to the discovery of nature's valuable secrets. To this end the work in the demonstration field is being pushed forward vigorously. Tests were inaugurated last year to study the effect of seeding cover crops between the cotton rows, bur clover, vetch and rye being used for this purpose. The intention is to turn these crops under in the spring that the green manure thus provided may enrich the soil. The rotation studies are being continued, and definite work has been undertaken with the idea of improving strains of oats, rye and wheat through hybridization. Tests with barley have also been instituted and some interesting results with a hulless variety have been obtained. A beardless rye first discovered in south Georgia gives promise of unusual value for cultivation throughout the state. In many respects it seems to be equal to the famous Abruzzi rye. A test with Soudan grain was undertaken this year. This is a grain imported from Egypt and gives especial promise for the south.

The data secured from the alfalfa plat is most instructive. Five cuttings were obtained last year with a total yield of approximately 6.5 tons per acre which would pay a handsome revenue even on the considerable cost involved in establishing this crop. The first cutting this year has been made and yielded 1.84 tons of cured hay per acre. It would appear that the growth of alfalfa in Georgia is practical, provided the land is properly limed and inoculated.

Inoculation seems to be a matter of vital importance, and something should be done immediately to provide the farmers of the state with guaranteed cultures at a reasonable price, for they are now being asked to pay $2.00 per acre for material which can be made at a cost of 25 cents per acre.

The fertilizer tests previously reported on are being continued and all the data obtained from the various lines of investigations are being carefully preserved and will constitute the basis of valuable bulletins which the department of agronomy hopes to issue with regularity in the future.

The breeding experiments with corn and cotton have been continued. The Sunbeam strain is still finding favor in Georgia and is now quite extensively cultivated. One man reports selling over 2,000 bushels of Sunbeam seed. In tests made at the North Carolina station it stood second in resistance to anthracnose, although planted between rows of a strain in which eighty per cent of the bolls were affected with this disease. The standardization of this variety is now in progress. One strain which has yielded at the rate of 3,000 pounds per acre made 1,400 pounds of seed cotton from the first picking. This strain is also high in oil. According to the determinations made by Prof. Rast, it contains 61.73 gallons of oil per ton of seed, whereas the average of many samples received at the Georgia oil mills runs about 52 to 53 gallons. Only one strain examined so far contains more oil per ton than Sunbeam, but the superiority of the Sunbeam in lint yield and earliness would more than offset this difference. Reference is here made to Pullnot cotton which contained 63.04 gallons of oil per ton. The poorest sample examined contained 49.36 gallons of oil, or 14 gallons per ton less than the highest, which at 40 cents a gallon would make a difference in the value of the seed for oil production of $5.60 per ton, equivalent to a possible saving on Georgia's million ton seed crop of $5,600.000. The percentage of nitrogen was found to vary by 1.355 per cent between Bramblett's and strain No. 26 of Sunbeam, which is equivalent to a difference of 27 pounds of nitrogen per ton, which at 27 cents for organic nitrogen influences the feed and fertilizing value of these two varieties to the extent of $5.40 per ton. On the basis of an annual crush of 5,000,000 tons, these figures represent a possible saving of $27,000,000 to the cotton growing states. This illustrates the valuable qualities possible to engraft on our most important crop through scientific breeding. As a matter of fact, the improvement made in Sunbeam cotton fully justifies this Board in claiming that in this particular alone the institution has paid back to the state many times its actual cost.

The Fruit Plantations.

The horticultural department has improved its plantations very considerably. A pecan orchard has been established, and a new barn erected in the place of the one destroyed by lightning last summer, affording much-needed facilities for housing work stock and tools.

The various lines of work reported before have all been continued. The orchard has proven especially valuable to the department as a means of providing instruction for students in pruning, spraying and grafting. The work with trucking crops is being enlarged from year to year as the reclamation of the land set aside for this department progresses. The appointment of a man to take charge of the grounds, gardens, orchard and greenhouse has materially strengthened the working force of this department.

The Campus.

The aesthetic tastes of students should be cultivated. This is quite as important to young men as the mere acquirement of book knowledge. Every effort is being made, therefore, to improve the College grounds by the planting of groups of trees and shrubs, sodding of exposed banks, the development of paths and roadways and the gradual clearing out of the College park. Following your instructions, pillars defining the entrance to the College grounds have been erected, and the bank adjacent to the car tracks has been graded, sodded and a hedge of spiraea set out. The wisdom of placing the grounds under the immediate supervision of a competent foreman is fully justified by the improvements already effected.

Additions to the Plant.

The greenhouse, for which provision was made last year, is nearing completion. It is of semi-iron or pipe-frame construction. The foundation is of brick and concrete. A large workroom has been built on one end, covered with a tile roof to harmonize with the other buildings. A battery of three greenhouses has been erected, each being 50 x 75 feet, thus providing 11,250 square feet of floor space. Two of these houses will be used by the department of horticulture for the purpose of research and to illustrate the principles involved in greenhouse management from the standpoint of the florist and truck grower. The third house will be used jointly by the departments of agronomy and chemistry for student instruction and for studies in seed testing, plant breeding and soil investigations. The greenhouse constitutes a most important addition to the equipment of the institution, since it provides facilities for both research and student instruction. It cost about $7,500.00 exclusive of the work done by the horticultural department.

Contracts have been let and work begun on a dairy wing for the main College barn, also for a new cottage for the farm foreman. The plans for these buildings have been drawn in the department of farm mechanics and are being erected under the supervision of Prof. L. C. Hart. A number of the farm buildings have been repainted and considerable new fencing built. Additions to the library and several laboratories amount to $10,398.58, making the total expenditure under the head of permanent improvements $17,898.58.

Chancellor Barrow and certain friends of the College succeeded in having the prison commission send twenty-five convicts to Clarke county with the understanding that the Commissioners of Roads and Revenues would take these men in charge and give the College of Agriculture half of their time for the purpose of building necessary roads through the farm. The profiles of these boulevards have been prepared and it is believed that the principal driveways can be constructed through the aid of these convicts. The institution is under many obligations to the Chancellor and its friends for the very successful manner in which they handled this matter, and to the commissioners of Clarke county for their active aid and coöperation in making this arrangement possible. It is needless to point out that the work done under this plan will be worth several thousand dollars to the institution and will materially improve the appearance of the property as well. You will observe that work under this agreement has already commenced.

Special Work of the Departments.

Every department of the College is engaged in some important welfare work. A number of the activities would be classified as demonstrations; other as research projects. While many of the tests are being carried on in the fields and laboratories at Athens, many of them are being conducted in different parts of the state. All of the departments are serving the public through extension work, personal correspondence, contributions to agricultural papers and attendance upon meetings of state and national importance.

Department of Agronomy.

The department of agronomy is continuing its work in soil improvement studies, and is advising farmers about methods of handling lands, maintaining farm records, and the use and application of fertilizers. The improvement of cereals is being carried on at several points. Among the notable developments is the securing of ten-acre tracts of land in Turner and Brooks counties on which experimental plantings will be made this fall. Three-acre test plats are now established in twenty-eight counties, making eighty-four acres in all. These plats have been located on the better defined type soils of Georgia to secure information concerning rotations, and the use of lime and fertilizers.

Aid has been rendered many farmers who are endeavoring to improve their seed corn, oats and cotton through selection, fifty-five farmers being visited last year. One farmer is now selling his corn at $4.00 per bushel and placing a superior strain on the market.

The use of 1,000 pounds of caustic lime increased the yield of cowpeas in south Georgia by 1,168 pounds per acre; in north Georgia by 516 pounds. The consolidation of the departments of agronomy and cotton industry was effected during the year. This arrangement has been found advantageous.

Department of Animal Husbandry.

The department of animal husbandry has created unusual interest during the year in the introduction of improved live stock. Special emphasis has been laid on Percheron horses, and Hereford, Shorthorn and Holstein cattle. Seven carloads of stock have been purchased for farmers. Advice concerning the feeding, care and management of these animals has been freely given. Efforts are being made to establish community breeding centers, and the sympathy of bankers and other representative men, has been enlisted in this important undertaking, so that now farmers in many parts of the state find themselves in position to secure loans on reasonable terms for the purchase of live stock. Live stock husbandry will best enable the farmer to inaugurate crop rotations and thus prepare himself to fight the boll weevil most successfully. The department has been able through its activities to save farmers much money and insure their securing sound animals of a type best adapted to the community.

An experiment was conducted last summer in which a comparison was made of cotton seed meal and cotton seed cake in the fattening of beef cattle while grazing and being finished in the stall. Judging by these results, cake can be fed with advantage while cattle are on grass, but meal is likely to prove most profitable with stabled animals. A large number of pure-bred animals have been sold from the College farm during the year. Extensive educational exhibits of live stock were made at the State Fair at Macon, and the Georgia-Carolina Fair at Augusta. The correspondence in the department of animal husbandry is very heavy. During the year a bulletin on Hog Raising in the South was issued.

Department of Horticulture.

The department of horticulture has been active in advising and coöperating with truckers and horticulturists. Definite investigations are being carried forward with reference to the canning of sweet potatoes, the cultivation and fertilization of pecans, apples and strawberries. A bulletin, entitled, "Vegetable Gardening in Georgia" was issued during the year. Experiments with cover crops in the orchard are being carried on at Athens and at other points as well. A vigorous campaign has been conducted illustrating the necessity of spraying both fruits and vegetables. As a result, in one county where two years ago only about ten per cent of the growers sprayed, only about ten per cent now fail to spray. An endeavor is being made to aid truckers, and to advise them about handling and marketing vegetables. Trouble in marketing has militated more against the development of this industry in the southern part of the state than anything else. Tests of all the new varieties of garden crops are being conducted in order that definite information as to their value may be offered truck growers.

Department of Agricultural Chemistry.

The department of agricultural chemistry is directing its energies towards the promotion of soil survey work. Reference has been made elsewhere to the large areas surveyed this year and to the importance of mapping type soils and analyzing them that their pronounced deficiencies in plant food may be ascertained. The completion of the physical survey of ten counties in one year shows that the department has been extremely active. It is greatly to be regretted that a larger force of chemists cannot be employed so that the analytical work can be carried on cotemporaneously with the physical surveys. The members of this department have made some interesting investigations which have led to a modification of methods used in soil analysis whereby they have obtained more consistent results. Naturally, a considerable amount of energy has been consumed in editing physical survey reports of Dougherty, Chattooga, Troup, Jones, Gordon, Talbot and Jeff Davis counties which have been prepared in coöperation with the Bureau of Soils. The head of this department was elected a fellow in the American Association for the Advancement of Science. He is also general Secretary of the same association.

Department of Veterinary Science.

The department of veterinary science continues the manufacture of hog cholera serum. The quantity made was 321,000 c.c., an increase of 99,000 c.c., over last year. The quantity of serum distributed is 317,020 c.c, which represents an increase of 191,980 c.c., over the previous year. When the manufacture of serum was commenced it was sold at 2.5 cents per c. c.; it is now sold at 1.5 cents c. c. The price has therefore been reduced forty per cent, which certainly constitutes a record of which the department has reason to feel proud in view of the fact that all the serum is tested, thus adding to the expense, before it is sent out. According to the Bureau of Statistics of the U. S. Department of Agriculture, the loss of swine in Georgia fell from 165 per 1000 to 90 head per 1000 during the past pear. This is a reduction of over 45 per cent and represents in round numbers 136,500 head of swine, equal to a saving of $1,365,000. The total cost of the serum work in so far as the College is concerned is $3,000 a year. Surely the expenditure of this small sum of money on the part of the state is well worth while. The department hopes to shortly institute coöperative work with the Bureau of Animal Industry in some county in Georgia for the purpose of demonstrating that this disease can be completely stamped out.

During the past year it has been very difficult to secure satisfactory hogs for the serum plant. They have been purchased from Tennessee, North Carolina, South Carolina and Florida. The freight rate makes them comparatively costly by the time they are received at the College. Furthermore, it is impossible to find the history of these pigs. Some of them have been treated with serum and some of them have gone through an infection, thus acquiring a natural immunity so that it is impossible to use them as test pigs. If sufficient funds were made available, more satisfactory pigs from the standpoint of quality, individuality and size could be produced on the College farm. Aside from facilitating the production of serum, the breeding and feeding operations would be of value to the students in animal husbandry in studying swine management.

Department of Forestry.

The department of forestry continued its study of sample plats established in Madison county. The herbarium has been considerably enlarged during the year and notes taken on the distribution of trees. Several forest tracts were examined during the year and advice offered the owners thereof.

Department of Farm Mechanics.

The department of farm mechanics is charged with the responsibility of preparing plans and specifications and supervising the construction of such buildings as are essential on the College farm.. Attention has already been directed to the work done with reference to the greenhouse and the dairy wing of the main College barn. During the year buildings have been designed for the College to the value of $30,000. Only part of them have been built but the preparation of these plans represent a saving of $1,500 to the state. You are familiar with the type of building now being erected. Mr. Joseph E. Wing, of the Breeders' Gazette, says this is the most durable and economical form of construction for farm buildings he has ever seen. He is probably one of the most widely traveled agriculturists in America. Blue prints and specifications have been furnished 49 persons covering such structures as beef, dairy and horse barns, hog cots and silos. The value of the buildings thus provided for amounts to over $80,000. During the summer the head of this department supervised the construction of a dairy barn on the farm of the State Normal School. Over 8,000 feet of permanent roadways have been plotted during the year.

Department of Poultry Husbandry.

The energies of the department of poultry husbandry have been largely taken up with the organization and improvement of the plant. Time has been found to commence the establishment of poultry clubs, as previously indicated. The clubs are being organized on a utility basis and prizes are to be awarded, not for the best chickens alone, but for the best work done by the boys and girls. The poultry industry of the state has been greatly neglected and the department finds itself in receipt of many requests for advice concerning buildings, breeds and equipment. In the absence of experimental data, many lines of elementary investigation must be promoted to secure definite information for the advice of poultry raisers. Every effort to make the work effective is being put forth. During the year a 32-page bulletin on "Poultry on the Farm" was printed and widely distributed.

Department of Extension.

The department of agricultural extension installed educational exhibts at the Macon and Augusta fairs, involving the expenditure of much time and effort. The exhibits were attractive and so arranged as to graphically illustrate the fundamental value of the information accumulated by the various departments of the college. A moving picture machine has been purchased and the secretary of the department has made a large number of films which are to be used for educational purposes in connection with meetings held to advance the interests of rural schools, boys' and girls' clubs, and farmers and their wives. The films are of an instructive character and reproduce satisfactorily. Many applications for their display and for permission to use them by commercial concerns have been received. They will add much to the forcefulness of the service the extension department can render isolated communities.

Extension-Demonstration Work.

As an illustration of what may be accomplished through demonstration work, your attention is directed to the acreage of melons and truck planted this spring in Ben Hill, Irwin, Thomas, Colquitt and Tift counties under the direction of three county advisers. The acreage in watermelons is 850, canteloupes 675, Irish potatoes 1515, sweet potatoes 900, cabbage 60, onions 16, string beans 150, tomatoes 100, corn for roasting ears 30, cucumbers 110, peas and squash 20, or in all 4426 acres. This work is carried on in coöperation with several railroads and chambers of commerce which are defraying part of the expenses of the special men assigned to this territory by the College and the Bureau of Plant Industry of the U. S. Department of Agriculture. In addition, these three agents are instructing 350 corn club boys, 300 canning club girls, 150 pig club boys and 300 adult farmers. They have been active in aiding in the establishment of breeding centers for hogs and beef cattle and in securing the installation of dipping vats and the erection of silos. Considerable areas are being prepared for fall planting to alfalfa and other clovers.

Pig Club Work.

This work was begun last September and clubs have been organized in twelve counties. The agent in charge of this work represents the College of Agriculture and the Bureau of Animal Industry of the U. S. Department of Agriculture. The progress made during the initial year is quite commendable. 970 boys have been enrolled and literature supplied them. A large number of teachers' institutes and other meetings have been attended and prizes secured for contests at the Valdosta and Macon fairs to the value of $775.00.

Direction has been given to experiments in curing meat in ice-making plants, a method which is attracting wide attention, both within and without the state. If the future results prove as satisfactory as those already obtained, it is believed that this method will solve the problem of curing pork in the south and eliminate the heavy losses now encountered by swine raisers owing to the frequent occurrence of unseasonable weather.

The Executive Office.

The administrative office has supervised the work of the College and the extension-demonstration service. The institution has now grown to such proportions as to make the volume of work and correspondence which must be transacted quite onerous. The funds to be directly administered are nearly four times as large as in 1907. The College and the correlated agencies now expend nearly a quarter of a million dollars annually. This office is naturally called on to aid in the general direction of all funds raised locally. Active support has been afforded the Smith-Lever bill which recently passed Congress and was signed by the President. You will no doubt recall that a trip was made to Portland, Oregon, in the interest of the original measure and some of its more important provisions were suggested by representatives of this institution. Its passage marks an era in agricultural educational development in the United States and should presently result in doubling the income of the College and greatly increasing the staff of workers as well. The correspondence with farmers has now grown to burdensome proportions yet it constitutes an essential part of the work of the College.

During the year addresses were prepared for the following meetings: Cotton Seed Crushers' Association, Atlantic Beach; American Association of Farmers' Institute Workers and Association of Agricultural Colleges and Experiment Stations, Washington, D. C.; State Chamber of Commerce, Macon; Southern Railway officials, Atlanta; State Apple Convention, Cornelia; Conference for Education in the South, Louisville; Middle Tennessee Educational Association, Nashville; State Teachers' Association, Macon; Cotton Manufacturers' Association, Atlanta; Inter-State Cottonseed Crushers' Association, New Orleans. Invitations were received to address the following associations, but had to be declined owing to important matters requiring attention at the College: S. C. Bankers' Association, Lake Toxaway, N. C.; Michigan Bankers' Association, Detroit; Graduate School of Agriculture, Columbia, Mo.; Mississippi Cotton Seed Crushers' Association, Meridian; Alabama Cotton Seed Crushers' Association; and American Millers' Association, Chicago. In addition, lectures were delivered at the following places in the state: Decatur, Atlanta, Macon, Baxley, Thomson, Winterville, Commerce, Rome, Clarkesville and Bainbridge.

A large number of special articles have been written for the press of this and adjoining states, setting forth the advantages of agricultural education and the opportunity which Georgia affords for investment. No request for assistance which could possibly be met has been declined.

Needs of the College.

The rapid development delineated in this report should convince the most skeptical of the urgent need of additional equipment. Every department is overcrowded and students cannot be taken care of satisfactorily except by sectioning the classes. The cost of this arrangement renders it impracticable without a substantial increase in maintenance. Last winter there were more than 500 people under instruction at one time. Adult farmers and young men and women came to the institution from all parts of Georgia. It was necessary to provide instruction for the men and boys in stock judging, yet they had to sit out in the open without cover on improvised seats, whereas, there should have been a suitable pavilion for this work that they might receive instruction in this important subject under comfortable surroundings.

The department of agronomy must of necessity have more room for its soil laboratory. Provision must soon be made for a large addition to the farm mechanics building. Cottages are needed for farm laborers.

A veterinary building is a most important need. Degree courses in veterinary medicine should be provided for immediately. The eradication of the cattle tick in Georgia is now proceeding rapidly, and the establishment of animal industries makes the training of leaders in this special field an imperative need.

The poultry department needs another building, and the purchase of the Mack property is essential.

There will be a substantial increase in students next year. The College is expected to train the men who are to act as county agents under the provisions of the Smith-Lever bill. To do this will require large endowments from the state for buildings, maintenance, and the development of the extension projects now under way. I respectfully and urgently direct your attention to the requests authorized by the Board last year. I sincerely trust that an appeal of sufficient force will be made to the incoming legislature to secure funds so sorely needed to maintain the efficiency of the College and promote its development along consistent lines.

Increase in maintenance from $60,000 to $85,000. In this amount $10,000 is to be used for establishing a degree course in veterinary medicine, and $15,000 to provide additional equipment and facilities, employ tutors and instructors where needed, and provide for the many contingent expenses which an institution of this character has to meet on account of its exceptional growth.

Increase in extension appropriations from $40,000 to $85,000. Of this amount $20,000 is to be used for boys' and girls' clubs and demonstration work; $10,000 for soil surveys; $5,000 for the establishment of live stock breeding centers; $5,000 for teachers' training courses in elementary agriculture, and $5,000 for poultry husbandry.

If the money sought for extension work is obtained funds equivalent to between $55,000 and $60,000 will be secured from federal and other sources for the furtherance of this work. If the appropriations are not obtained a good part of this money will go to states willing to appropriate money on the basis of dollar for dollar.

Naturally, it is essential that the appropriation of $2,500 made for several years past, with the exception of last year, for the holding of farmers' institutes, and the $3,000 appropriation for the manufacture of hog cholera serum be continued.

The income of Georgia is not far from $6,000,000 annually. The College seeks $175,500 for maintenance and extension work. This is a little less than one-thirtieth of the state's total revenue and surely is a reasonable amount of the state's income to spend for agricultural development.

It is incumbent upon your Honorable Body to ask for $100,000 for another building. The necessity of more room in many of the departments is apparent to any one who reflects for a moment on the remarkable increase in attendance. The present plant was built to care for 200 students. The College has only one academic building. We cannot permit boys to be turned away from its doors who seek an agricultural education.

Those who are of the opinion that these requests are unnecessarily large have probably failed to recall that the state has $100,000,000 invested in live stock, 291,000 farms covering 37,584,000 acres of land and 342,129 white boys and girls to educate and train. Many of the institutions in the United States receive for the support of a single department more than is sought from the legislature for the maintenance of the State College of Agriculture and all the varied interests which it represents. At the present time we are receiving as much in the way of contributions from the people of the state directly and indirectly and through our coöperative relations with the U. S. Department of Agriculture as is being appropriated by the General Assembly. In the report of last year attention was called to the unanimous endorsement accorded the College in resolutions passed by the Georgia Dairy and Live Stock Association, the State Horticultural Society, the Georgia Breeders' Association, and many other representative organizations. State and local chambers of commerce, boards of trade and the press of the state have unanimously commended its activities which seems to indicate that the public appreciate the reasonableness of the requests made and the necessity for the proper endowment of all work calculated to place our agriculture on a permanent and efficient basis.

Student Interests.

The interests of the student body have been safeguarded to the best possible advantage. There has been practically no sickness during the year and attention to duty has been better than ever. There has been less complaint of student delinquency from professors. The constant raise in standards for entrance has not militated against attendance, save possibly in the one-year course. The students have given their active coöperation to the staff in the preservation of good order and the protection of the state's property. The students govern themselves, and I desire to express my thanks to the senior class for the active support they have given to every suggestion made with reference to advancing the interests of the student body or curbing obectionable tendencies on the part of any thoughtless individual.

The Agricultural Quarterly has been handled in a most creditable manner and is closing the year with a comfortable balance to its credit. The students of the College are particularly anxious that a club house be erected for use as a social center and as a home for such organizations as are now in existence or may be established later. They are willing to contribute something towards the erection of a building of this kind and ask your active coöperation in securing the needed funds. I do not believe any patriotic citizen could do a more worthy service than through the gift of $10,000 to $20,000 for the erection of a building for this purpose. I sincerely hope some friend of agriculture will provide the needed funds at an early date.

Inventory.

The inventory for 1914 is presented for your information:

Land, 830 acres	$167,500.00
Main building	135,000.00
Greenhouse	7,500.00
Houses on College property	4,000.00
Power house, including installation of heating plant, light, water, plumbing, sewerage, gas, sidewalks, etc.	35,000.00
Department of agronomy, including barns, houses and demonstration field equipment	14,306.00
Photographic room	340.00
Department of forestry, including Lumpkin Hall	11.041.84
Department of horticulture, including barns, grounds and other equipment	12,261.00
Extension equipment and exhibit cases	2,948.60
Department of agricultural chemistry, including soil laboratory	6,062.36
Library and seminar room	5,816.64
Department of farm mechanics, including new laboratory	10,022.05
Department of veterinary medicine, including hospital and serum plant	10,417.05
Department of poultry husbandry, including new buildings	8,490.00
Department of animal husbandry, including dairy	2,505.00
Live stock on farm	13,580.00
Farm buildings, barns and tenant houses	14,240.73
Tools and implements	2,945.50
Total	$463,976.77

The total value of the property is approximately $463,976.77, the enhancement for the year being $13,476.13, after allowing for a substantial decrease due to wear and tear. You will observe that the buildings owned by the College are now worth approximately $195,740.73. Of this amount $55,690.75 is invested in houses, barns and laboratories. The value of the buildings operated by the several departments is as follows: Agronomy, $5,725.00; Animal Husbandry, $14,240.75; Horticulture, $9,000.00; Farm Mechanics, $5,000.00; Veterinary Medicine, $5,000.00; Forestry $10,000.00; and Poultry Husbandry $2,725.00. The land owned by the College is valued at $167,500.00; and the live stock, farm buildings and implements at $30,766.25. There has been a fair increase in the value of the equipment and laboratory apparatus available for instruction, research and demonstration. The investment for these purposes now amounts to $70,285.34. This sum naturally includes laboratory furniture, and the live stock and implements on the College farm. The accumulation of this property in so short a period and without special appropriations save for maintenance, except in the case of the main building, constitutes an achievement of which you have reason to feel proud.

Resumè.

The record of the year is before you, and it would appear to be one of satisfactory progress along all lines. The failure of the legislature to appropriate funds was offset in some measure by the local endowment of the extension-demonstration work. The College needs an immediate addition to its maintenance fund of $10,000 that its faithful and efficient staff may be paid adequate living salaries and that such new courses may be instituted as will permit the students to specialize sufficiently, and at the same time secure a thoroughly liberal education in the arts, sciences and technical subjects relating to agriculture. Certainly a degree course in veterinary medicine should be established. There are 1200 doctors of veterinary medicine in the United States, and by this I mean professional men of high standing. Of this number only 45 are in Georgia; certainly, not a sufficient number to cover effectively 60,000 square miles of territory and look after the welfare of a live stock industry valued at $100,000,000.

In spite of the many handicaps under which we labor, considerable progress in adding to the physical and scientific equipment has been made during the year. The College grounds and farm never presented a better appearance, and they are daily becoming more and more the center of agricultural interest in Georgia. Visitors come in ever-increasing numbers and the problem of entertaining them is a serious one. Professors and instructors are so overloaded with work that they cannot take time from their manifold duties to show visitors about. Some means for conveying them over such an extensive property should be provided. The growth in correspondence and the many commendatory letters received lead me to believe that the College is more widely appreciated than ever before, and that farmers are looking to it to serve them along a variety of lines which will aid materially in advancing the civilization of the state through placing its agriculture on a permanent basis.

If faithful, persistent work and belief in agricultural ideals will win success for the institution, its future is assured, for the staff has been loyal to duty and has sacrificed personal interests in a manner which must be as much of an inspiration to you as it has been to me. Possessed of a unity of purpose and working with high resolve, the student body and the faculty of the institution have enabled the attainment of results which were not thought possible a few years ago.

The Chancellor of the University has never swerved from his devotion to the interests of the College, and his firm faith has been a source of strength and inspiration. His kindly advice coupled with mature judgment have enabled me to push the work forward with renewed vigor in the face of many perplexing situations. I esteem it a privilege to bear tribute to his zeal in the cause of agricultural education.

The Board suffered an irreparable loss on September 29, 1913, in the death of Judge A. J. McMullan, of Hartwell, one of the most distinguished citizens of the state, and an efficient, loyal and faithful patron of the College of Agriculture from its inception. A fitting memorial was prepared and inscribed on the minutes by direction of the Executive Committee. We can only console ourselves with the thought that our loss is his gain. That he will be greatly missed from the annual gatherings of his colleagues is certain, and it is needless to say that all who had the privilege of associating with him in life will ever treasure his memory. You will be gratified to know that the Governor appointed the Hon. L. L. McMullan, of Hartwell, as his father's successor, thereby insuring to the institution the hearty support and appreciation which it has always enjoyed from that section of the state.

As a Board of Trustees, you have overlooked mistakes, approved and commended successful plans and policies, and through your generous support made executive burdens a pleasure to bear. The administrative officer who is responsible to you may count himself fortunate, for in no single instance have I known of any action to be taken save that which was believed by the Board of Trustees to be in the best interest of the College, its student body and staff, and the people of the state. I trust it shall be my good fortune to continue to enjoy the large measure of confidence you have seen proper to repose in me in the past.

Very respectfully,
ANDREW M. SOULE,
President.

c
296 – 2a C
914/15

Lib

Annual Report of the President

Georgia State College of Agriculture and the Mechanic Arts

UNIVERSITY OF ILLINOIS LIBRARY
MAR 6 1917

UNIVERSITAS GEORGIAE
1785

—TO—

BOARD OF TRUSTEES

Georgia State College of Agriculture

JUNE, 1915

UNIVERSITY OF ILLINOIS LIBRARY

Report of the President, State College of Agriculture and the Mechanic Arts

To the Honorable Board of Trustees
of the Georgia State College of Agriculture.

Gentlemen: In compliance with the regulations, I transmit for your consideration a report on the work of the Georgia State College of Agriculture and the Mechanic Arts for the collegiate year 1914-1915.

The war now raging in Europe has in no sense diminished the duties and responsibilities of the institution. On the other hand, there has been a widespread appeal for specialized service and assistance. In an endeavor to meet the demand thus suddenly imposed upon the College, our resources have been strained to the breaking point. In a crisis such as that through which we are now passing, technical institutions are expected to provide the leadership essential in blazing out new trails and in making those discoveries necessary for the proper maintenance of our industries, especially where long-established sources of supplies are suddenly rendered unavailable and certain forms of farm practice thrown into chaos through the closing of the normal channels of trade. The measure of recognition extended technical institutions under the circumstances, while very gratifying, but emphasizes the inadequacy of their present equipment and the fallacy of not organizing and maintaining them on a basis of the highest efficiency so they may more thoroughly serve the nation in times of sudden industrial stress. Should this fact become as generally realized and appreciated as it should be, technical institutions in America may be greatly benefited as a result of the European war.

Enrollment.

Surprising as it may seem, there has been an increase in the registration of students, evidencing the faith our people have in the value of education and their determination to make unusual sacrifices to give their children an opportunity to enjoy the benefits which collegiate courses confer. The total number of students enrolled was 712. Of this number, 171 were in the College of Science and Engineering, and 541 in the College of Agriculture. The attendance upon the degree courses in the College of Agriculture shows a substantial increase. One hundred and fifty-three men were enrolled in these courses, being an increase of 23 over last year. There are 27 men in the Senior class, or more than five times as many as in 1909. The maintenance of a high entrance requirement does not seem to have affected the attendance adversely. You may also be interested to learn that while 84 hours of work are required for a degree, a number of students have selected this institution in preference to those where only 60 hours are required.

Student Enrollment in Past Eight Years.

Year	Long Courses.	Short Courses.	Total.
1908	67	104	171
1909	62	124	186
1910	98	100	198
1911	115	110	225
1912	161	66	227
1913	185	165	350
1914	182	284	466
1915	191	350	541
Total _ _ _	1061	1303	2364

Increase in short courses in eight years _ _ 236 per cent.
Increase in degree courses in eight years _ _ 185 per cent.
Increase in all courses in eight years _ _ _ _ 216 per cent.

You will observe that the enrollment in the long courses is 191, and in the short courses 350. This represents an increase in the long courses of nine, and in the short courses of 66 over last year. The total number of students instructed at Athens in the past eight years is 2,364. The increase in the short courses in eight years is 236 per cent, in the degree courses 185 per cent, and in all courses 216 per cent. These figures do not include the students registered in the extension schools.. These schools are regularly organized in a given community and last for a week. A series of definite lectures and demonstrations are provided in each instance. One hundred and fifty persons were enrolled and paid a special fee, and as many more were permitted to attend as visitors. At the five points where schools were held more than 5,332 persons heard one or more of the various lectures by the experts in the extension department. Institutions throughout the north and west credit themselves systematically with all students registered in extension schools. I think this matter is of such importance that it should be called definitely to your attention, for in the future an ever-increasing number of extension schools will be held, provision for their maintenance having been made under the terms of the Smith-Lever act.

Graduates.

The acceptance of the Smith-Lever act, which provides for the employment of county agents, means that the graduates of the College of Agriculture will find ample opportunity for some years to come for the display of their resourcefulness and the practical demonstration of the value of the training received at the College. You will no doubt be interested to learn that seventeen of our recent graduates are at present acting in the capacity of county agents, and are acquitting themselves in a creditable manner. A considerable number of the present graduating class will enter this field of service.

You can easily see that the most difficult problem with which the College has to deal at the present time and for some years to come will be that of training a sufficiently large number of young men to discharge the arduous duties of county agents in a satisfactory manner. Georgia affords so many openings for qualified agricultural experts that only a part of each graduating class can be counted on as available for demonstration work. Many of our graduates are particularly interested in live stock farming, and quite a number of them are engaging in work of this character. They have already made their influence felt in this direction throughout the state.

I am glad to report an increased interest in the study of forestry and to state that two of our graduates have secured positions in the Forest Service. The south has been negligent with reference to the training of young men to enter the service of the federal government in the various lines of effort correlated with the work of the United States Department of Agriculture. As a result, there are comparatively few southern men in the several bureaus. It is the purpose of the College to so train its graduates that they can fill government positions in an acceptable manner.

Summer Courses.

For the first time the College is offering a number of summer courses of collegiate grade. This step has been taken in response to the growing demand made upon the institution by under-graduates and men from other colleges located both within and without the state, who desire to continue their studies during the summer vacation. A number of men who have received the degree of B. A., for instance, have found it impossible to complete the work for the degree of B. S. in Agriculture in two years unless permitted to take up certain courses in the summer. A tuition fee of $20.00 is charged and a sufficient laboratory fee to provide for the materials used and to cover breakages as well. Courses this year are offered in agronomy, animal husbandry, horticulture, farm mechanics, veterinary medicine, agricultural chemistry, poultry husbandry, and forestry at the Forest Camp, Margret, Ga. Through the medium of the summer course, the plant at Athens can be used to marked advantage and it is believed an ever-increasing number of young men afforded an opportunity to secure instruction along the lines in which they desire to specialize. I feel that every effort should be made to encourage these summer courses for reasons which are obvious.

In this connection I desire to emphasize the need of continuation courses and to express the hope that at no distant date it may be possible to so organize certain departments of the College as to enable representative men to pursue studies leading to the doctor's degree in agriculture. Such an arrangement would not impose a heavy financial burden on the state, and surely it is not necessary to emphasize the need of encouraging research in view of the fact that there is a tendency for our lint cotton to fall below the ⅞-inch standard. We must also be impressed with the wonderful results which have been obtained in certain European countries through the support of agricultural research, thereby enabling vast populations to be maintained effectively in times of greatest stress and supplying from a limited area of territory large amounts of raw materials for the maintenance of industries which in many instances have exerted a dominating influence in commercial fields.

Reports of Professors.

As in previous years, the professors' reports are transmitted for your advice. They are worthy of your careful consideration, for they reveal a high personal sense of duty and a willingness to make sacrifices in the interest of the College. The strain upon our professors grows yearly more severe. The increase in the number of students calls for greater exertion, while the congestion incident to the growth of the short courses leads to the conclusion that it will be necessary before long to arrange them so they will occur at different times throughout the year. In this connection it is important to remember that our professors are all responsible for a large number of laboratory periods. Thus, their time is fully occupied and they have little opportunity for rest and recreation. Heads of our departments also direct the special work in their charge, and which in the aggregate amounts to a very great deal. For example, most men would think they were busy if they had the college farm or the demonstration plats to supervise. In addition, each professor is called upon to serve the needs of people in all parts of the state through a heavy, detailed and ever-increasing correspondence, and is answerable in large measure for the efficiency of the extension work related to the special line which he represents.

The records show that the departments are instructing as many as 153 regular students and 350 short course students. Some of the departments have had from 350 up to 488 students under instruction during the past year. On the basis of enrollment by subjects, this means that in several instances instruction has been given to the equivalent of 1,200 individual students. The University hours of teaching of the several departments vary from 15 up to 29 per week, while the number of laboratory hours ranges from 20 up to 50. Several of the departments are carrying as an average for the year the equivalent of 26 to 40 hours a week of collegiate work. These figures are presented that you may better appreciate the very considerable burden which the efficint instruction of our present student body imposes upon the several departments.

It is needless to say that the faithfulness of the faculty, their cordiality, their readiness to make sacrifices in the interest of the College, and their constant endeavor to serve the best interests of the state have been a source of inspiration to me individually, and I am sure their consecration to duty will not fail to win your appreciation as well.

Changes in Staff.

The trustees have been fortunate in retaining the services of a majority of their most valuable professors. Of course, certain changes are unavoidable, and it is only natural that men should withdraw where they receive flattering offers, which we are unable to offset by reason of our financial limitations.

L. L. Jones, Adjunct Professor of Poultry Husbandry, resigned to accept a position in the extension department of Purdue University.

A. Akerman, Professor of Forestry, withdrew to engage in private work.

Elizabeth G. Holt, in charge of Girls' Clubs, resigned to take up work with the State Department of Education.

H. H. Rothe, Adjunct Professor of Veterinary Science, resigned to undertake the commercial manufacture of hog cholera serum.

L. S. Watson, Instructor in Agronomy, was transferred at his own request to the position of county agent of Wilcox county.

R. R. Childs, Instructor in Agronomy, was transferred to scientific assistant in agronomy in coöperation with the United States Department of Agriculture.

A. B. Pike, Field Agent in Dairying, resigned to accept a more lucrative position in New Hampshire.

S. H. Starr, B. S. A., University of Georgia, was appointed Instructor in Agronomy.

E. G. Welch, B. S. A. E.,. Iowa State College, was appointed Instructor in Farm Mechanics.

L. G. Proctor, B. S. A., University of Georgia, was appointed field agent in Hog Cholera Control.

James B. Berry, B. S. F., M. S., University of Minnesota, was appointed Professor of Forestry.

R. F. Irvin, B. S. A., Michigan Agricultural College, was appointed Instructor in Poultry Husbandry.

E. C. Westbrook, B. S. A., University of Georgia, was appointed Instructor in Agronomy.

R. M. Gridley, B. S. A., Iowa State College, was appointed Instructor in Animal Husbandry.

Lois P. Dowdle was appointed assistant in charge of Girls' Clubs.

F. H. Denniss, B. S. A., University of Toronto, was appointed Field Agent in Dairying.

L. M. Roderick, D. V. M., Ohio State University, was appointed Instructor in Veterinary Medicine.

Paul Tabor, B. S. A., University of Georgia, was appointed Fellow in Agronomy.

Charles Buchwald, B. S. A., University of Georgia, was appointed Fellow in Agricultural Chemistry.

The following men are associated with the work of the College through the signing of a Memorandum of Understanding with Secretary Houston, United States Department of Agriculture, which was duly presented to the Board and approved at the last annual meeting:

A. L. Hirleman, D. V. M., Cincinnati Veterinary College, Field Agent in Hog Cholera Work.

W. H. Howell, B. S. A., University of Missouri, Scientific Assistant in Dairy Husbandry.

C. J. Goodell, B. S. A., Purdue University, Scientific Assistant in Animal Husbandry.

G. L. Bigford, B. S. A., University of Wisconsin, Scientific Assistant in Animal Husbandry.

D. J. Taylor, B. S. A., Purdue University, Field Agent in Poultry Husbandry.

College of Science and Engineering.

It seems needless to again point out that additional buildings and equipment are necessary to the welfare of the College of Science and Engineering. Not only is a thoroughly modern and up-to-date building a primary need, but in addition there should be a liberal increase in the maintenance fund. At least $10,000.00 a year is essential to provide the necessary facilities to permit of the proper reorganization of the work of the College of Science and Engineering. I sincerely trust that this very important matter will engage your attention, and that the legislature at its approaching session will recognize this need and make provision therefor.

Library.

A technical institution cannot make progress without an adequate library. Every effort has, therefore, been made by your direction to provide a good working library. There are at present 2,665 bound books and 12,000 bulletins and pamphlets on file. One hundred and sixty newspapers are received regularly in return for the plate matter sent out by the editor. One hundred and forty publications come to the reading room, most of which are obtained in exchange for the bulletins of the College and the Agricultural Quarterly. A limited list of selected magazines is subscribed for. Most of these relate in some way to the work of the institution. That the library is appreciated is shown by the constant use made of it by both students and Faculty. A greater amount of assigned reading has been done than ever before. The present reading room is badly crowded, so much so in fact that students frequently cannot find seats therein. All the space available for book shelves has now been filled up, and the necessity of enlarging the library immediately becomes a paramount issue. With the growth of the library there is a large increase in the amount of detail work necessary to keep track of the books and perform other incidental but necessary clerical service. The time is not far distant, therefore, when additional help will be required. The importance of the library as a factor in the education of our students and as one of our most essential laboratories cannot be over-emphasized. I feel it a duty to call this matter to your attention and urge that every possible provision be made for enlarging and increasing our library facilities at the earliest possible moment.

Editor.

The free plate service established by the College several years ago is being extensively used by the weekly prss, and has been unanimously endorsed by the Georgia Weekly Newspaper Editors' Association. Through the medium of this service it is possible for the College to place before the people such data and information as would likely be of primary interest in connection with the varied problems with which the farmer and the housewife have to deal. During the year five shipments of plate, equivalent to 4,500 columns of printed matter, have been sent out to 150 newspapers within the state, reaching in this way 300,000 people each week. The daily press has also been furnished with from two to four items a week, and the agricultural press has been supplied with articles calculated to reveal the nature of the work carried on by the College, and also likely to supply practical information to farmers. One column of matter has also been supplied semi-monthly to the "University Items." You will no doubt be glad to know that our editor was honored with the presidency of the National Association of College Editors at its last annual session.

Boys' and Girls' Short Courses.

One hundred and sixty boys and seventy girls were registered in the special short courses offered for the scholarship winners in the various county and state contests. These boys and girls naturally represent the youthful leadership of the respective communities from which they came. They were a bright, intelligent lot of youngsters, and it was an inspiration to look into their faces. These boys and girls represent one of the few definite efforts made to reach out into the rural home and bring the young people directly in contact with those leavening and uplifting influences which an institution like the State College of Agriculture represents. Their return directly to the farm means that they will become potent factors in the dissemination of concrete knowledge so important to the welfare of the rural communities. Governor-elect Harris, who addressed one of the morning convocations, said he had never spoken to a more representative audience or one which he felt was in keener sympathy with the message which he desired to convey.

These young people were enabled to come to the College by reason of the scholarships to the value of $25.00 offered by patriotic citizens, county boards of education, boards of trade, chambers of commerce, the Georgia Bankers' Association, the State Fair Association, the Atlanta Corn Show, and a number of the leading railroads operating in the state. Representatives of most of these organizations were present at some time during the progress of the short course, and were high in their praise of the character of instruction offered the boys and girls. That they thoroughly approved of the work is shown by the fact that most of them have already renewed their offers of scholarships for next year. Thus, for the sum of $25.00, these boys and girls are privileged to receive two weeks of highly specialized and intensely practical, yet with all scientific instruction in agriculture and home economics. Citizens from every walk of life who came in contact with these boys and girls were surprised at the interest they evidenced and the keenness of perception displayed by them. They grasped and made their own the information placd before them more completely than many of the adults present. There is in my opinion no effort which the institution has undertaken to foster which promises to be of more permanent value to the state than the development and enlargemnt of the short courses for boys and girls.

As an evidence of the economic and social value of the corn clubs, your attention is directed to the fact that the average yield of corn per acre has increased within the decade from ten to eighteen bushels, equivalent to more than 20,000,000 annually for the entire state. The Georgia Railroad Report states that in the year ending June, 1914, they hauled 60,678 tons of corn, as compared with 104,434 tons during the previous year. This represents a decrease in tonnage equal to 1,562,714 bushels on one railway. This does not mean a reduction in consumption of corn, but an increased production at home. Appling, Rabun and many other counties, are now selling instead of buying corn. The scope of the work of the boys' corn clubs has been enlarged by the development of what are known as four-crop clubs. More than 500 boys conducted a three-acre demonstration in 1914; one acre was planted to corn, one to cotton, and one to oats followed by cowpeas.

Conference for Farmers.

The usual winter meetings were held last January. At that time the Georgia Dairy and Live Stock Association, the State Horticultural Society and the Georgia Breeders' Association held their annual conventions. The dates were so selected that many of the boys and girls, the county agents and farmers attending the short courses were enabled to hear the addresses of the speakers brought from various sections of the United States for this special occasion. Dr. A. C. True, Director of the Office of Experiment Stations, was among the prominent persons who addressed the conference. Mr. Joseph E. Wing, of Ohio, repeated his lectures on alfalfa to audiences which taxed the auditorium to its utmost capacity. Prof. Jarnagin is secretary of the Dairy and Live Stock Association, Professor McHatton, of the Horticultural Society, and Professor Rast, of the Breeders' Association. These men are called upon to perform much extra work in connection with the annual gatherings of these societies. The service rendered is valuable, not only to the individual members, but to the larger interests which these organizations represent throughout the state. Through the kindness of citizens of Athens, a buffet luncheon was given the visitors. This luncheon was prepared by Miss Creswell and the canning club girls. Fully 500 persons attended the various conferences.

District Agricultural Schools.

The usual meeting of the principals of the District Agricultural Schools has been arranged for Saturday, June 5th. It has been very difficult to find a date satisfactory to all the parties concerned. Indications are that there will be a good attendance, and attention will naturally be centered on those problems which are of primary interest to the schools. The recommendations previously made with reference to the betterment of the schools, need hardly be repeated. They are as urgent as ever. Prof. J. S. Stewart has examined the schools as usual, and has prepared the annual report concerning their work, which will be printed and distributed as a College bulletin in accordance with your directions.

Extension Department.

A summary of the meetings organized by the extension department from April 1, 1914, to April 1, 1915, is shown in the following table. This constitutes an important feature of its work.

Kind of Meeting.	No.	Counties.	Attendance.	Miles. Traveled.
Extension Schools.	5	5	5,332	9,863
Summer meetings	61	61	19,642	9,445
Teachers' institutes	2	2	225	348
Girls' canning clubs	388	43	19,400	23,570
Live stock meetings	40	28	1,570	13,059
Corn club and farm demonstration	917	142	105,393	93,449
Pig clubs	204	15	9,846	15,443
Hog cholera control	73	32	5,646	12,053
Miscellaneous meetings	56	56	15,554	10,388
Educational exhibits	6	6	40,000	1,050
	1,752		222,608	188,668

You will observe that 1,752 meetings were held and that practically all the counties in the state were visited once or more. In case of work recently inaugurated only a few counties can be reached. In some instances one county is much more aggressive than another, and may on this account receive a larger share of benefit from the extension service. Every endeavor is made to treat all the counties uniformly and to serve their needs acceptably in so far as the financial situation will permit. The meetings were attended by 222,608 persons, while the men charged with the supervision of the work traveled 188,688 miles. These figures are very difficult to grasp, and it is doubtful if most persons fully realize just what they mean in the way of bringing useful information into the various communities visited, eliminating error and replacing it with truth, and bringing inspiration and hope into the lives of thousands of persons with whom our men come in contact even for a short time.

The extension work you will observe has made a satisfactory growth in spite of the withdrawal from our income of $2,500.00, which was used for many years for the maintenance of farmers' institutes. It is still impossible to respond to the calls made upon us by many communities for assistance in the way of sending speakers to miscellaneous meetings, including agricultural and educational rallies. That there is a real need for an appropriation to take the place of the fund formerly received for farmers' institutes is shown by the fact that 61 meetings were held in as many counties last summer with an attendance of 19,642 persons. Most of these meetings were held on a farm and not in town. Therefore, the rural community was effectively reached. Five week-long extension schools were held in February and March at Ashburn, Dublin, Sparta, Macon and Euharlee. Five thousand three hundred and thirty-two persons received more or less formal instruction at these schools. This is the third year for work of this character, and marked improvements were effected as might be anticipated. A carload of cattle was carried along for use in live stock instruction, and a car of scientific apparatus and exhibit material for illustrating the course in soils, farm crops, horticulture and animal and poultry husbandry. The extension school, in other words, undertakes to provide a short course for the people of a given locality. In accordance with the instructions of the Board of Trustees a registration fee of $1.00 was charged and a minimum of thirty students required. A registration of fifty will be required in 1916. This promises to be one of the most efficient forms of extension service which the College has inaugurated, and I feel that it should be as vigorously supported and advanced as finances will permit.

Industrial Clubs.

The enrollment of the boys' corn clubs now approximates 10,500, distributed through 142 counties. Girls' canning clubs are established in forty counties with an enrollment of 3,600. Pig clubs have been promoted in twenty counties with an enrollment of 1,380, and poultry clubs in ten counties with an enrollment of 600. The total number of boys and girls registered, therefore, in the several club organizations is 16,080. Surely this is a progressive army of young people with high ideals and actuated by the most worthy of motives, namely, to improve conditions in the open country and show the possibilities of Georgia soil and sunshine when properly mixed with brains. This constitutes an army of leaders, who have already demonstrated the latent possibilities of our soils under proper management, and who have not only succeeded in acquainting themselves with many fundamental truths, but have won the well merited consideration of the adult population of the state for what they have already accomplished. They have attracted much favorable attention towards Georgia, and by their mastery of elementary truths have made themselves more forceful and valuable citizens.

In this connection it is well to remember that 3,000 boys exhibited samples of corn from their acre plats at the Atlanta Corn Show last December. The average yield was 56.6 bushels, and the cost 41.5 cents. In other words, they grew about four times as much corn per acre as the adult farmers. Certificates from the State College of Agriculture were issued to 106 boys for growing 100 or more bushels of corn per acre at a cost of 30 cents or less per bushel. More than 150 girls raised 100 pounds or more of tomatoes on a tenth-acre of ground. The average value of the fresh and canned vegetables was $60.00 per plat. The members of the pig clubs showed that pork can be raised in Georgia on grazing crops at a cost of 3.5 cents per pound, thus making possible the extensive development of swine raising in the state. While there are those who may have a personal contempt for the lowly porker, it must not be forgotten that the farmers of Kansas and Nebraska removed the Wall Street mortgages from their lands by hog ranching, and that the success of some of the European countries in so far as the effective nutrition of their armies is concerned is due mainly to the fact that they have been well supplied with an abundance of pork products.

To those who are afraid of the shadow of materialism which they think work of this character is to cast athwart our progress, let me say that the elimination of waste and the conservation of human effort can never degrade any people. Surely, it is infinitely better that these boys and girls should be taught to think, to reason, to understand and appreciate nature and to deal with her intelligently and successfully rather than to be her drudge and slave, as has been the case too often in the past. If we are to compete successfully with the keen intellects which other nations are striving to develop in their people, and if we are to make our own state happy and prosperous and our people successful, we must teach them to understand, appreciate and deal successfully with the elementary things by which they are surrounded, and out of which they must not only obtain a living, but a surplus, for the development of culture and refinement.

Demonstration Work.

The demonstration work has had a successful year. It is conducted coöperatively with the Office of Farm Demonstration Work of the United States Department of Agriculture. At present work is being carried on with men and boys in 75 counties and with girls and women in 42 counties. There are 117 men and women agents employed at the present time. Eight thousand one hundred and twenty-four farmers are carrying on demonstrations on their land under the direction of the county agents, while 500 women are carrying on work under the supervision of the women agents. The agents are also responsible for the work of the boys' corn and pig clubs and the girls' canning and poultry clubs as well. You will thus see that in all the demonstration work is reaching directly and indirectly 24,704 individuals. Last year the adult demonstrators had 13,400 acres in corn, which made an average yield of 40.1 bushels; 8,450 acres in cotton, with a yield of 1,315 pounds of seed cotton, and 2,844 acres in oats, with a yield of 52 bushels. In 1914, 195,476 acres of summer legumes and 155,536 acres of small grains were grown by demonstration methods. Cover crops were seeded by 2,682 demonstrators, while 1,680 selected their seed from the field for the present year's crop. Through the advice of the county agent the demonstrators applied 31,020 tons of lime and removed stumps from 21,620 acres of land. The agents were largely responsible for the establishment of 670 permanent pastures, the screening of 962 houses against flies and mosquities, the installation of 60 water systems and 80 telephone lines. They also inoculated more than 50,000 hogs, advised farmers how to prepare 3,350 rations for feeding live stock, suggested the improvement and establishment of 1,664 gardens and lawns, and aided in the formation of 310 coöperative buying clubs, thereby effecting a saving of $30,000.00 to the members.

The special meetings held by the agents in their several counties totaled 1,212, and the attendance aggregated 124,539 persons. The agents also made 3,189 visits to schools, and met personally 48,897 teachers, parents and pupils. The agents give their entire time to the field work, and traveled last year in their own conveyances 334,386 miles. You will observe that many counties are without agents at the present time. This defect cannot be remedied unless the state makes larger appropriations than are now available. The legislature will have an opportunity to do this at its approaching session, since the increase provided for Georgia under the Smith-Lever act amounts to $25,174.00 for the fiscal year 1915-1916, and to $46,151.00 for the fiscal year 1916-1917. If these funds are offset by state appropriations, a considerable proportion of the increase thus provided can be used for the purpose of employing additional county agents. The public appreciation of the county agent is best shown by the fact that business men, farmers, educators and chambers of commerce have subscribed during the present year of financial stress more than $46,000.00 towards the maintenance of the agents now employed.

Distribution of Printed Matter.

Title.	Edition.	Pages per copy.	Total pages.
Wheat Production in Georgia	15,000	4	60,000
Disinfecting Farm Buildings	15,000	4	60,000
Announcement of Short Courses	2,000	12	24,000
Alfalfa in Georgia	10,000	8	80,000
Analyses of Soil Types of Chattooga Co.	2,000	40	80,000
Special Courses for Boys' and Girls' Clubs	1,000	4	4,000
Forest School Announcement	2,000	4	8,000
Incubation and Brooding of Young Chicks	5,000	8	40,000
Spray Calendar for Georgia	10,000	8	80,000
Illustrated Prospectus	2,000	20	40,000
Pecan Growing in Georgia	5,000	24	120,000
Boys' Corn Club Work, 1914	15,000	16	240,000
Hog Cholera Prevention	10,000	24	240,000
Boys' Pig Clubs in Georgia	2,500	8	20,000
Apple Culture in Georgia	5,000	36	180,000
Girls' Club Work in Georgia, 1915	10,000	16	160,000
Poultry Clubs in Georgia, 1915	2,500	4	10,000
Announcement Summer Forest Camp	2,000	8	16,000
Summer Cotton Grading Announcement	1,500	4	6,000
Cotton Variety Tests, 1914	5,000	4	20,000
College Catalogue	2,500	92	230,000
Farmers' Conference Report	1,500	200	300,000
Silage Crops for Georgia	5,000	4	20,000
Announcement of Summer Courses	1,000	4	4,000
Vegetable Gardening in Georgia (2d Ed.)	5,000	56	280,000
Total	137,500	612	2,322,000

The impression that farmers are not interested in agricultural literature is not well founded, at least so far as Georgia is concerned. You will observe that we are steadily increasing the number of our publications from year to year, yet in spite of the fact that 25 bulletins were printed in editions aggregating 2,322,000 pages, we are quite unable to supply the demand for printed matter. Many of our bulletins are now distributed through the county agents, and, therefore, placed directly in the hands of those who are primarily interested in securing the information they contain. Thousands of requests for bulletins are received annually. In all the College has published in the past eight years 101 bulletins and circulars in editions aggregating 885,000 copies and containing 20,283,000 pages. At least twice as much money as is now available could be spent to the very best advantage in supplying that rapidly growing percentage of reading Georgia farmers with helpful literature.

Scholarships, Prizes and Gifts.

Friends of the College have continued their contributions for scholarships and prizes. Their liberality in this respect is highly appreciated. Among the principal contributors are the following: Virginia-Carolina Chemical Co., $500.00; Southern Railway Co., two scholarships valued at $250.00 each, and the proceeds from two bales of cotton, amounting to $77.90; Cotton Seed Crushers' Association, $25.00; American Coal Products Co., $25.00; DeLaval Separator Co., a separator valued at $75.00; H. G. Hastings & Co., $20.00; Georgia Bankers' Association, $825.00; State Fair Association, $350.00; Atlanta Corn Show, $430.00; Central of Georgia Railway, $175.00; Georgia, Southern and Florida Railway, $175.00; Atlanta, Birmingham and Atlantic Railway, $300.00; Rome Chamber of Commerce, $240.00; Rome Women's Club, $100.00; Woodruff Machinery Co., $100.00; R. D. Thomas, Blackshear, Ga., $150.00, making a total of $4,067.90.

Short course scholarships and prizes were also contributed by many individuals, women's clubs, bankers, corporations, boards of trade and boards of education to the amount of $1,579.25. The total amount received for scholarships and prizes thus amounts to $5,647.15.

The Georgia State Fair Association contributed $500.00 towards the installation of the College exhibit at the Macon Fair, and $675.00 towards the maintenance of county canning club agents. The following sums were paid in to the treasurer for the support of county agents: Clarke Co., $200.00; Cobb Co., $100.00; Muscogee Co., $400.00, and Atlanta Chamber of Commerce, $1,000.00. These sums total $2,875.00, and make the receipts for the year for all purposes, $8,522.15, as compared twih $3,973.05 in 1914.

The College has also been the beneficiary during the year of many small gifts, and the recipient from firms and individuals of considerable apparatus and equipment, either free of cost or at greatly reduced prices. The American Coal Products Company donated $300.00 worth of sulphate of ammonia to the Agronomy Department; Col. B. W. Hunt and other friends gave valuable collections of plants to the Department of Horticulture. The Forestry Department has received quite elaborate exhibits of saws, logging tools, and samples of lumber from many varieties of trees in the rough and also showing the different finishes. The Forest Museum has thus had several hundred dollars' worth of material given it during the year for exhibit and instructional purposes. We are greatly indebted to our friends for these evidences of appreciation and for the liberal financial support accorded the boys' and girls' work in particular.

Coöperative Relationships.

The policy of the Board with reference to the coördination of the effort of all agencies concerned in agricultural development work has been continued. The College and the Bureau of Soils of the United States Department of Agriculture completed physical surveys during the year of Polk, Jackson, DeKalb, Turner, Laurens and Washington counties. The chemical survey of Stewart county has been finished, and that of Habersham and Jones partially completed. Reports of the physical surveys of Talbott, Stewart, Jones and Jeff Davis, and of the chemical survey of Chattooga county have been published. Within the past six months 2,965 square miles of territory have been mapped. The total number of square miles surveyed in Georgia in the past four years is 8,398. Since the College has only been able to place one man in the field and to assign two chemists to analytical work, it would appear that excellent progress has been made. Of course, the United States Bureau of Soils is spending several dollars for each one spent by the state. It is regrettable that a larger appropriation has not been available for this work, for which there is a most insistent demand on the part of the public. The importance of the soil survey can hardly be over-estimated in a state where the types are so numerous and varied as in Georgia. It is needless to point out that the ascertainment of facts about the soil is fundamental to agricultural progress. This work could be greatly enlarged at a moderate cost. Surely, an effort should be made to increase the scope of the soil survey work if only for economic reasons and the conservation of the energy of those who cultivate the land.

Reference has already been made to the demonstration work as carried on in association with the Bureau of Plant Industry. By recent congressional action this work has now been transferred to the Office of States Relations, but this does not affect in any way the organization from this end of the line.

The field agents in dairying maintained jointly by the College and the Dairy Division of the Bureau of Animal Industry have done good work during the year in spite of interruptions due to certain unavoidable changes in personnel. Some thirteen barns and dairy houses, and about twenty silos have been built or are in course of construction. Herd records of 200 cows are being kept and a large number of dairymen have been benefited by direct correspondence. Churning demonstrations have been held at a good many points with highly beneficial results. Two men are now giving their entire time to the dairy field service and a third has been assigned to this work temporarily. Emphasis is being laid on the construction of silos for it has been clearly shown that with the silo and cotton seed meal beef and dairy animals may be profitably maintained in Georgia and our animal industries developed in a measure commensurate with our needs.

The work of the pig and poultry clubs is also carried on coöperatively with the Division of Animal Husbandry of the United States Bureau of Animal Industry. This bureau has also two beef cattle experts at work in tick-free territory in association with the animal husbandry department of the College.

Hog cholera control work is also being carried on in connection with the United States Bureau of Animal Industry. One man with headquarters at Athens is giving his entire time to holding educational meetings, at which demonstrations with reference to the use of hog cholera serum are made. The College has one field agent coöperating with the Bureau of Animal Industry in the work it is carrying on for the purpose of showing the feasibility of eradicating hog cholera in selected areas in the Southern states. This work is now in progress in Decatur county.

As matters now stand and by reason of the coöperative relations existing with the various bureaus mentioned, the state of Georgia and this institution are participating in the expenditure of at least $80,000.00 of federal funds for agricultural development work. Thus, the total appropriation made for extension work for the state of Georgia is offset on the basis of two dollars for one at the present time, exclusive of any funds which may accrue to Georgia by reason of the Smith-Lever act.

Coöperative work is also being carried on by the College with the State Department of Agriculture through Commissioner J. D. Price and his assistants.

Boys' corn and pig and girls' canning and poultry clubs are carried on in association with the public school system, and yoeman service has been rendered the club work by the State Superintendent of Public Instruction and his supervisors, the county boards of education, the county superintendents and the teachers generally. It is gratifying to record this pleasant relationship.

The College continues its coöperative work with the Central of Georgia Railway in the matter of maintaining test farms. There are now 25 such farms in Georgia containing from 22 to 56 acres, which in spite of the low price of cotton made a profit of 6 cents up to $25.65 per acre in 1914. On ten of these farms the lowest return was $14.04 net per acre. Since there are a thousand acres in these farms and they are widely scattered throughout the state, the results obtained fully corroborate the statement so frequently made that where a good rotation of crops is established and a wise policy of cultivation and fertilization instituted, good profits can be made from Georgia soils. They also vindicate the claims made by the College with reference to the methods of farm practice which should be established in order to insure the largest material return to our land owners.

The chambers of commerce of Atlanta, Macon and Columbus continue their aid towards the maintenance of local and district agents for the boys' corn and girls' canning clubs. Very liberal contributions have been received towards the maintenance of county agents in men and women's work from the State Fair, local boards of trade,. county boards of education and individual citizens as well. The counties coöperating in the above enterprises contributed to demonstration and corn club work $36,000.00, and to the canning club work, $10,000.00. Prizes aggregating $18,000.00 for boys and $7,000.00 for girls were contributed and offered as premiums at the hundred or more county and district fairs held throughout the state last fall. Mention has already been made of the very considerable funds contributed for scholarships, which amounts to approximately $5,647.15. The funds available, including prizes contributed at fairs and for scholarships, thus reach the splendid total of $76,647.15, of which $46,000.00 was available for the maintenance of extension-demonstration work. This sum added to the funds derived from direct and indirect congressional appropriations and the College, makes a total of $126,000.00, or $29,500.00 in excess of the funds received last year. Including prizes, and scholarships, the total sum available for the furtherance of the field service during the fiscal year now closing was $156,647.15. In view of the financial stress which has prevailed this should be accounted a remarkable exhibit and constitutes the only evidence needed to show the high place which the extension service has won in the affections of the people of Georgia. Including the funds received from coöperative agencies and state and federal sources, and provided the state offsets the amount available to Georgia under the Smith-Lever act, there will be available for expenditure during the ensuing year for extension-demonstration work in Georgia approximately $176,000.00. This does not include the amount which will be spent for prizes and scholarships. The Board should feel gratified that through its excellent management of the institution, it has been able to win this large measure of support for work of this character from so large and varied a constituency.

The College Farm.

Considering the general depression which has prevailed, a satisfactory financial showing has been made by the College farm. The receipts for the fiscal year are $10,173.60, which represents a decrease of $161.86 as compared with 1914. As a matter of fact, the receipts from the dairy are over $500.00 more than ever before, totalling $6,562.60 for the year. The profit on the farm was $2,847.04, and on the dairy $2,554.60. The sale of farm products, including live stock, amounted to $3,411.00, or nearly $700.00 less than last year, which virtually represents the difference in the sale price of the cotton raised on the farm in 1913 and 1914. In other words, under normal conditions the farm would have made a satisfactory increase. Under the circumstances, I feel we have cause for congratulation in that such a comparatively good financial showing has been made under such extraordinary conditions.

An inspection of the farm will reveal that additional work has been done in the matter of improving fences and roadways, cleaning out patches of briars and stumps, straightening out the lines of the several fields now cultivated, improving the terraces, and extending the area of cultivated land. The systematic development of the roadways through the coöperation of the Clarke County Commissioners and the Prison Commission constitutes the greatest single improvement made in some time. These roadways are now in very good condition and afford ready access to the greater part of the property.

The dairy wing of the main barn has been completed, and is now ready for use. It is an excellent structure of its kind, and will serve the purpose for which it was built admirably. It will also afford useful object lessons to our students and visitors. Two laborers' cottages have been built at a cost of $600.00 each. They are four-room houses, with brick and cement foundations and walls of metal lath, plastered with cement. They are very economical, and yet satisfactory.

The acreage laid down to alfalfa was extended last fall and the crop is in a promising condition. The stand has also been well maintained on the older established areas. This crop is of peculiar value and interest to dairymen. The acreage devoted to the various crops is as follows: Corn for grain, 50 acres; corn for silage, 30 acres; oats, 87; cotton, 14; cowpeas, 9; alfalfa, 9. Rye will be planted on 50 acres; peas after oats on 79; silage after oats on 8. The total area cropped during the year is thus 336 acres. A portion of this land, as you will observe, will be double cropped.

Live Stock.

There are 163 head of live stock on the College farm, consisting of 21 horses and mules, of which 3 are pure-bred Percherons; 25 pure-bred Jerseys, 16 pure-bred Holsteins, 2 pure-bred Herefords and 11 pure-bred Shorthorns. There are also 9 grade Jerseys, 12 grade Holsteins, 39 grade Herefords, 13 pure-bred Tamworths and 15 pure-bred Berkshires. There are thus 95 pure-bred animals representing seven breeds now on the farm. Cost account records of the dairy herd have been kept, and a number of cows have made the advanced registry. The Shorthorn herd has developed quite satisfactorily during the year, and by your authority, arrangements are now being perfected for the material improvement of the Hereford herd in so far as the purchase of pure-bred animals is concerned. There has been little difficulty in disposing of the surplus of the herds. The demand for beef animals has been especially strong. There is every reason to believe that the development in this direction will continue to grow as the result of the freeing of ever-increasing areas of the state from tick infestation from year to year. You will observe that the number of pure-bred animals is constantly increasing. It seems desirable that the College shortly maintain only pure-bred herds as an object lesson not only to the students, but in order that the sale of any surplus stock may be made the means of insuring the permanent improvement of the live stock in the community to which the animals are sent.

A conservative estimate of the value of the live stock now on the College farm is $14,532.50, an increase for the year of $952.50.

The sales of live stock amounted to $2,406.16, and included 25 dairy animals, of which 10 were pure-bred; 35 beef animals, and 36 hogs, making a total of 96 animals sold. Every effort has been made to secure a wide distribution of these animals throughout the state and to encourage the establishment of breeding centers for the purpose of developing one type or breed at certain definite places. The College commenced work with Hereford cattle several years ago, and as a result of this effort the breed has now become widely distributed throughout the state, and is regarded with favor in all sections. This is but one instance of the manner in which the institution has been able to serve the people of Georgia to advantage through the agency of the College farm. Similar results were obtained with Percheron horses and Tamworth hogs. Attention is now being centered on Shorthorn cattle because it is realized that this is one of the best of the beef breeds and that there is plenty of room in Georgia for its wide dissemination and profitable development.

The Poultry Plant.

A brooder house 14x56 feet, capable of taking care of 1,200 chicks, has recently been completed. This adds a much-needed structure to the equipment of the department of poultry husbandry and will enable the brooding of chicks to be carried forward systematically at any season of the year. Plantings have been made on the grounds during the spring, not only for their beautification, but to provide shade for the chickens. As urged in previous reports, it is important that the land adjacent to the plant and now occupied by negroes be purchased as soon as possible. This acreage is needed not only for the extension of the plant, but to insure the prompt removal of unsightly buildings. Four hundred and fifty hens were maintained during the year, and 1,500 chickens have been hatched and brooded during the spring. The usual instruction has been offered to both long and short course students. Arrangements have been made during the year by which men can take two successive years of poultry work. The fact that fourteen Juniors elected the course shows that there is a demand for instructional work of this character. The short courses offered to boys and girls were well patronized, the lectures and demonstrations being attended by quite 200. Since these boys and girls, and their teachers as well, come directly from the homes of the state, any information which can be afforded them is of great practical importance in the furtherance of the poultry industry of Georgia. Since October 1st the poultry club work has been in charge of Mr. D. J. Taylor, being carried on coöperatively by the College and the United States Department of Agriculture, as already pointed out. Clubs have been organized in nine counties with an enrollment of 600. Several bulletins have been issued by the department during the year of primary interest to members of the poultry clubs.

The Experimental Field.

The work in the experimental field has been carried on along lines previously outlined. Some of the most interesting work accomplished during the year is the development of a strain of cotton known as College No. 1, which it is believed is superior in practically all respects to Sunbeam. This cotton is now being tested in different parts of the state for the first time. If the earliness of maturity shown last year can be successfully perpetuated, it will be a variety of great value in the sections of the state soon to be infested by the boll weevil. The test with Sudan grass indicates that May and June seedings will give a yield of from 1.5 to 2.5 tons of cured hay per acre. So much interest has been developed in this comparatively new forage plant that arrangements have been made to grow it at twelve different points in the state.

The original alfalfa plats are still in good condition and promise to yield as well as in previous years. This would indicate that alfalfa under proper conditions can be made to produce satisfactorily on the same land for several years in succession. The widespread interest in this crop justifies the inauguration of tests with acid phosphate and rock phosphate and a combination of the two to determine which of these top applications can be used to the best advantage in the cultivation of this crop. One hundred and twenty selections of oats and wheat furnished by the Office of Cereal Investigation, United States Department of Agriculture, were started this year. Tests of these are not only being made at Athens, but at Ashburn and Quitman, where two cereal substations have been established in coöperation with the Office of Cereal Investigation. The object is to develop strains of cereals adapted to middle and south Georgia. You will realize at once the importance and essential nature of this work. The cultural tests with oats, which have been in progress for several years, still show the drill slightly ahead of the open furrow method. Much depends, of course, on the preparation accorded the land. The time of seeding is an important factor in determining the yield obtained from winter oats. In a few instances the yield has been thirty bushels more with the same variety when seeded in October rather than in November. This is a matter of primary importance to the farmers of Georgia and should engage their immediate consideration.

Investigations of the oil content of cotton seed has been continued along the lines indicated in last year's report, and substantiates the fact that there is a difference between high and low oil yielding varieties of 10.4 gallons per ton. It also appears that the varieties of seed grown in south Georgia are comparatively low in oil content, and when grown on the College farm at Athens the oil content is materially increased. This would indicate, therefore, that soil and climatic conditions play an important part in the oil content of seed. No doubt it is possible to breed strains of cotton which will yield more oil and more lint, while possessed of a better staple for south Georgia conditions than are now cultivated. It is hoped to push work of this nature vigorously, for its economic importance will be quickly recognized by every person associated with the production of cotton. The field is so extensive that it is difficult to know just where to begin. For instance, an examination of the oil-bearing qualities of seeds from individual plants within a well-selected and developed variety shows a difference of 4.11 per cent in oil content, equivalent to a difference in yield of 10.95 gallons of oil per ton of seed. This indicates that there is an excellent opportunity for seed selection for high oil content even within a well-selected variety and it is quite possible that while selecting for high oil content the length and quality of the staple can at the same time be improved.

Greenhouse.

The most noteworthy development of the Horticultural Department during the year is the completion of the greenhouse. This is quite a substantial structure with permanent brick and cement foundations. The superstructure is designed especially for the work which is to be carried forward in the greenhouse and is strictly modern in every sense of the word. The erection of the greenhouse marks an era in the growth of the Horticultural Department, for it makes possible the carrying on of instructional work of vital importance to students during the winter season. It is also possible to illustrate by means of the greenhouse just what can be done in the way of forcing and propagating various garden and truck crops in Georgia. The grounds in and about the greenhouse have been improved by grading and planting with selected shrubbery. A battery of cold frames has also been completed.

The Campus.

The construction of a new road through the College arboretum is a noteworthy accomplishment of the year. This is one of the most attractive drives to be found anywhere. It also gives ready access to the arboretum by students and visitors, which is a marked advantage. As usual, quite extensive plantings of trees and shrubbery were made again this spring. The trees and plants already set out have made a good growth and are now attaining sufficient size to improve the appearance of the grounds to a marked extent. A good deal of sodding of terraces and roadways has been done, and considerable grading as well. Our grounds are quite extensive, as you have no doubt observed, and their parking, care and management is a task of no mean proportions. In view of the small amount of money which has been available, the results attained are quite gratifying. The location of the College is peculiarly fortunate and unless some untoward circumstance should arise we may look forward with confidence to the systematic beautification of the grounds from year to year until the site will become one of the most attractive occupied by any educational institution.

Additions to the Plant.

The most important permanent improvement of the year is the completion of the veterinary laboratory at a cost of $7,000.00. It is three stories in height, and covered with a tile roof to match the other buildings. It has brick and concrete foundations with cement floors and permanent partition walls. The superstructure is of brick veneer, while the interior is painted white. The rooms are large and well ventilated. Double floors have also been laid, thus guarding against fire loss and reducing the insurance rate to the minimum. The structure is designed to provide the best possible sanitation for the handling and manufacture of hog cholera serum. The demand for increased supplies of serum made the erection of this laboratory necessary. It was also essential that a type of construction be followed that would meet the full approval of the federal authorities charged with the supervision of the manufacture of hog cholera serum in the several states. It is said by those competent to know that this laboratory is one of the very best now in use in the United States, being superior even to that owned and operated by the government at Ames, Iowa, and much better in its finish and arrangement than that used by most of the commercial plants.

These facts are emphasized to show that the Board of Trustees have made every possible effort to safeguard to the utmost degree the quality of the serum manufactured by the state for the benefit of Georgia farmers. Only one unit of the building has been erected, but as fast as funds permit, additional units will be finished. Eventually, the veterinary laboratory should constitute one of our most pleasing structures and afford ample facilities for such instruction and investigation as may be necessary to properly provide for the offering of the degree of D. V. M., an end which I hope to see consummated at no distant date.

Department Activities.

The organization of an agricultural college is different from that prevailing in most institutions. The departments of necessity have more or less outside work to superintend and direct. Agronomy could hardly be taught satisfactorily without fields in which to illustrate the principles set forth in the class room. The heads of the several departments are not only charged with instructional work, but much supervisory, and in many instances, research and extension work as well. Every department of the College is serving the public, therefore, as well as affording instruction to students. This is accomplished through extension work, personal correspondence, contributions to the agricultural press, and attendance upon meetings of state, national and international significance.

Department of Agronomy.

The test plats inaugurated by this department have been continued during the year. Work is in progress in 27 counties, while two special areas are devoted to cereal work at Ashburn and Quitman. Seed selection was carried on in 38 counties, and special types of cotton seed were distributed to eighteen counties. The tests already undertaken indicate, for instance, that phosphate is the limiting element in production on the Conasauga silt loam, and that greater efficiency will be obtained from the use of fertilizers if the soil is first put in proper physical condition. Results on the south Georgia test plats indicate that the single elements are seldom used at a profit. In several instances it was evident that the use of a properly compounded plant food ration would yield a profit to the land owner of $5.00 per acre, whereas, certain plant food formulas or partial formulas might often be used with very little advantage. Since Georgia cultivates about ten million acres of land in corn and cotton, it is easy to see that the experiments in question indicate a possible addition to our revenue of fifty million dollars a year. Farmers have come to recognize the wide variety of soil types which exist, and are seeking for specific advice in regard to them. The Department of Agronomy is constantly importuned to send our specialists to meet with groups of farmers and examine soils and prescribe as to their fertilizer needs. With the present force it is impossible to accomplish much in this direction. Work of so vital a character should be liberally maintained.

Department of Animal Husbandry.

The department of animal husbandry has centered its efforts on the organization of live stock breeders' associations in as many counties of the state as possible. Considerable progress has been made in this direction. Encouragement has been lent to the introduction of improved breeding stock and to the elimination of scrub animals, generally speaking. The growth of an adequate food supply for the maintenance of live stock through the improvement of pastures and the raising of a greater variety of forage and hay-yielding crops has been strongly emphasized. Much has been done towards stimulating an interest in the construction of silos. At least ten carloads of Shorthorn cattle have been brought into the state during the year, one car of Holsteins, seven cars of Herefords, and five cars of hogs. It is certain that a very considerable number of modern barns have been built through the effort of the department and plans furnished for 75 silos. Thus, progress is being made in equipping farms with a more profitable type of live stock, and when this is done, the solution of the market problem and the development of a proper system of diversification will be assured.

The usual educational exhibits of live stock were made at the State Fair at Macon. A carload of selected animals representing several breeds was also sent to the five extension schools held in February. Thirteen county live stock breeders' associations have been formed, and 67 swine demonstrations started. Experiments are in progress to show the effect of rock phosphate in animal nutrition. Live stock exhibits were judged at ten fairs.

Horticultural Department.

The Department of Horticulture is prosecuting most of the lines of work previously inaugurated, such as an effort to determine the influence of fertilizers on apples, pecans and tomatoes. The work with cover crops has been maintained, this matter being of special importance to north Georgia orchards, and, in fact, to all fruit growers with plantations situated on rolling land. Spraying demonstrations have been continued. A study of the pecan rosette is being pursued as vigorously as possible. Eight series of plats have been established in various parts of the state for the study of the above problems, while truck investigations are being conducted in ten counties along the A., B. and A. Railway. Some very interesting results have already been obtained, and this work, if supported, will result in the acquirement of data of much service to truck growers. There is reason to believe that one of the organisms causing spoilage in canned sweet potatoes has been discovered.

The value of the campaign inaugurated with reference to the spraying of fruits and vegetables is shown by the fact that one man from a single application saved $400.00. The materials cost $5.00 and were made under the direction of the department at a cost of 4 cents a gallon, whereas, the grower was asked 17 cents a gallon for the commercial article, which was no better than the home-prepared solution. Twenty thousand trees have been sprayed in one county this year, where none were sprayed three years ago. The department has been active in aiding schools and towns to landscape and park their grounds effectively. This is a most important undertaking, for it is quite true that we have neglected aesthetic studies to a deplorable degree in the United States. One cannot but be impressed with this fact who has ever had the privilege of visiting European countries and seeing what they have accomplished in the way of beautifying home grounds and parks under climatic and soil conditions distinctly inferior to ours.

Department of Agricultural Chemistry.

The department is continuing its examination of Georgia soils in coöperation with the physical survey carried on by the United States Bureau of Soils and this institution. Naturally, the physical surveys can be completed much more rapidly than the chemical surveys. With the present force of men and equipment it will take a hundred years to analyze the principal type soils of the various counties of Georgia. It is for the people to determine whether they can afford to wait so long to obtain the fundamental information on which a permanent type of agriculture must of necessity be based.

During the year chemical surveys of Stewart, Troup and Chattooga counties have been completed, and of Jones and Habersham partly completed. The analysis of the soil types of Chattooga county was published in bulletin form. This pamphlet contains some forty pages and shows among other things eleven distinct series of soils in that county. The nitrogen content varies in the top soil from 688 to 2,619 pounds; the phosphoric acid from 468 to 887 pounds; the potash from 4,386 to 20,268 pounds; and the calcium oxide from 459 to 2,400 pounds. These figures are enough to convince the most skeptical that there are some very definite problems involved in the successful cultivation of the lands of Chattooga county, and that simply guessing at the plant food deficiencies will not enable the owner of a farm to make any material progress. The examination of the soils of this county reveals their most marked deficiencies and indicates how these may be overcome by the establishment of a wise and definite system of rotation, the judicious use of acid phosphate and lime, and such soil-building crops as can be grown to advantage in that section of the state. It is needless to add that work of this character should commend itself to the attention of the people generally, and that sufficiently liberal financial support should be accorded it to develop it on a basis proportionate with the needs of our agriculture.

The use of ground limestone as a filler in fertilizer has attracted much attention of late. There seems to be well-founded objection to its use in combination with mixtures containing acid phosphate. To determine the rate and the extent of the reversion occurring in such an admixture, preliminary tests were started in which ground limestone was combined with acid phosphate at the rate of 600, 300 and 150 pounds per ton. The following table graphically illustrates just what occurred and shows that reversion took place rapidly at first, and while decreasing in rate continued until most of the water soluble phosphoric acid had been reverted. In one instance 5.16 per cent of the water soluble phosphoric acid was reverted at the end of eight weeks, and 7.8 per cent at the end of six months.

Influence of Ground Limestone on Reversion of Water Soluble Phosphoric Acid.

Amt. per Ton.		Percentage Water Soluble Phosphoric Acid.				
Acid phos. Lbs.	Ground limestone. Lbs.	On mixing.	Two weeks.	Four weeks.	Eight weeks.	Six months.
1400	600	9.01	7.37	6.52	3.85	1.21
1700	300	11.91	10.68	8.94	9.05	5.36
1850	150	14.42	13.88	13.60	11.11	9.23

The figures presented make it self-evident that the mixing of ground limestone and acid phosphate is a practice detrimental to the best interests of the consumer of mixed fertilizer. In this connection it is proper to state that the rate of reversion with green acid phosphate was much less than with the aged. These experiments are of so much importance to Georgia's agriculture that they will be continued and enlarged upon another year.

Department of Veterinary Science.

The Department of Veterinary Science is charged with supervising the manufacture of hog cholera serum in Georgia. The demand for serum has increased greatly since the work was first undertaken in 1912. For the year ending May 1, 1913, 222,000 c. c. were manufactured; the next year, 321,000 c. c.; and during the past year 787,220 c. c., or an increase over the previous year of 466,220 c. c. The price of serum up to January 1, 1915, was 1.5 c. c., but since that time it has been sold for 1.25 cents per c. c. The completion of the new laboratory will increase the facilities for the manufacture of serum, and it is believed the output another year can be practically doubled. In this connection it should be stated that the serum manufactured by the College has been tested by the government and reported of satisfactory quality. You will also be glad to know that the serum is manufactured and sold in Georgia at a lower cost than in contiguous states. In most of the neighboring commonwealths a considerable appropriation was made available for the erection of buildings and the installation of the necessary equipment at the inception of the work. In Georgia the small appropriation necessitated the building of the plant piecemeal. Nevertheless we now have one of the best plants in the south.

The department is also concerned in the promotion of the coöperative work with the Bureau of Animal Industry in hog cholera control and eradication in Decatur county, and in educational demonstration work among farmers carried on thorugh the maintenance of a veterinary field agent at the college. A summary of the work done under these projects shows that 30 clubs were organized, 201 meetings held, attended by 12,321 persons, 787 farms examined, 1,898 farmers interviewed, 333 persons instructed in the use of serum, and 42 counties visited involving 19,553 miles of travel.

Department of Forestry.

The Department of Forestry has inaugurated some very interesting projects within the year. Among the most noteworthy are the willow holt covering about one acre of land, the product of which it is expected the students will be taught to use in the manufacture of baskets which it is believed can be sold to advantage, thus enabling many boys to earn a part of the cost of their maintenance while at the College, and illustrating to the public at large the possibilities of osier cultivation. Another project to which the department is directing its attention is that of plant introduction. An experimental forest garden has also been established in which seedlings will be grown on a rather extensive scale. It is not intended that this shall be run solely as a commercial project, but rather for the purpose of illustrating to students how trees should be planted and cultivated. Of course, any surplus stock will be offered for sale with the hope of encouraging the replanting of at least a small per cent of our deforested areas. A small creosoting plant has been installed by the department and a comparative test of the value of different species of wood when properly treated will be made. Work will begin with fence posts since this is one of the most important and pressing problems requiring solution in view of the very considerable interest now evidenced throughout Georgia in live stock husbandry and which calls for the enclosure of rather extensive tracts of land.

Department of Farm Mechanics.

The department has designed during the year several buildings for the College and has supervised the construction of the veterinary laboratory. Two hundred and fifty blueprints, setting forth in detail the requirements for various farm buildings, have been sent out to farmers. It is estimated that these represent a value in completed structures of approximately $180,000.00. The department has also surveyed out three miles of permanent roadway and has aided and advised the Clarke County Commissioners in the construction of approximately two miles more. A timber physics laboratory was equipped during the year, thereby enabling the instructional work to be materially strengthened, and the conduct of tests of importance to the College and commercial interests generally undertaken.

Poultry Husbandry.

Home-prepared rations have proved as satisfactory as purchased feeds and enabled a saving of 25 per cent in cost. A 58-day test carried on with Rhode Island Reds, Barred Plymouth Rocks and White Leghorns indicated that the average value of the eggs laid when estimated on a yearly basis was $3.17. The cost of the feed was $1.25 and of labor 50 cents, leaving a net profit per bird of $1.42. Cotton seed meal has been used as a source of protein to good advantage. Only small quantities have been fed in the dry mash, but 20 per cent has been used in the wet mash with the result that egg production is now 33.3 per cent and increasing daily. These feeding trials indicate that animal protein is not as essential as has been thought by many, and since cotton seed meal only costs half as much as meat scrap, its importance as an adjunct to the food supply of the poultryman becomes apparent. These tests will be continued until positive results have been obtained, as information of this character is of great economic importance to poultrymen throughout Georgia. Ground limestone has proved an acceptable substitute for oyster shells. The ground limestone costs less than half as much as the oyster shells. It was fed mixed with the wet mash. In the rearing of young chicks a mixture of two parts of finely cracked corn and one part of ground oats proved as effective as purchased feeds costing as high as $6.00 per hundred pounds.

Extension Department.

The Department of Agricultural Extension organized and directed 61 summer meetings held in as many counties during the past summer. Arrangements have been made to hold 72 the present year. It is planned to hold meetings only where demonstration agents are maintained jointly by the College and the federal department and the local authorities. Two teachers' institutes were attended during the year, and 66 miscellaneous meetings were supplied with lectures. Moving picture exhibits were made at various points throughout the state, and a considerable number of high schools were also visited. The secretary of the department has made most of the films which are being used. There is naturally much interest in this line of work, and the moving pictures have been used to great advantage in illustrating to the boys and girls and adults as well just what an education pertaining to agriculture includes. This work should be encouraged in so far as practicable as it is one of the most effective means yet devised of illustrating to the farmer and his family the benefits to be derived from the institution of modern methods of practice.

Extension-Demonstration Work.

Since the field service is so extensive that it cannot be described in detail in the limited space at my disposal, it has seemed best to illustrate by an example what has been accomplished in Bacon, Coffee Crisp, Dooly, Macon, Thomas and Ben Hill counties, where trucking is the chief industry which the demonstration agents are endeavoring to promote. Twenty-five acres were planted to early corn, 27 acres to beans, 8 acres to tomatoes, 250 acres to watermelons, 2,910 acres to cantaloupes, 50 acres to Irish potatoes and 35 acres to sweet potatoes. There are also 1,020 acres in permanent peach orchards, the owners of which have been advised about pruning and spraying the same. You will observe that 3,305 acres are devoted to truck crops, thus insuring a very considerable degree of diversification in the counties mentioned. These truckers are also being aided in so far as possible in finding markets for their crops, this work being primarily carried on by the railroads. In addition there are in the seven counties 600 corn club boys, 300 canning club girls, 150 pig club boys, and 667 adult farmers carrying on demonstrations with general field crops. Much has also been done in this section to encourage the establishment of breeding and feeding centers for live stock, while the county agents have been instrumental in having a considerable number of dipping vats and silos built. A good deal of lime has also been used in this territory, and a considerable acreage is being planted to hay and pasture crops.

The Executive Office.

The usual service has been performed by the executive office. Naturally, there is a large amount of detail involved in the execution of the extension-demonstration work. The College has also grown rapidly and an endeavor to finance its most urgent needs satisfactorily involves the exercise of much forethought. The College handles directly $149,408.38. It is also concerned in the direct and indirect administration of an additional $156,647.15 derived from federal and local sources. You will thus see that we are now expending or supervising in a measure the expenditure of more than $306,055.53 annually. One of the gravest responsibilities of the executive lies in the necessity of raising large sums of money from local sources each year to offset federal appropriations available to Georgia for the furtherance of extension work.

The inauguration of projects under the Smith-Lever act has added materially to my duties. The regulations for the expenditure of ihts money are most exacting. Fortunately, we have been able to present a series of projects which have met with the approval of those in authority, and if the legislature offsets the funds available to Georgia, there is every reason to believe that the year ensuing will be one of distinct progress along all lines. It is a matter of regret to me personally that I have not been able to respond to the many calls to deliver addresses before various organizations and institutions both within and without the state. The large amount of detail work and the very heavy personal correspondence which it is necessary to carry on relative to the extension service and in response to letters received directly from farmers makes it exceedingly difficult to get away from the College. By the advice of the Executive Committee, I have endeavored to discharge first the duties of the home office in a satisfactory manner.

The Royal Society of Arts, established in London, England, in 1754, and one of the oldest organizations of its kind in the world, elected me a fellow last February. During the year addresses were delivered before the Association of American Agricultural Colleges and Experiment Stations on "The Administration of the Smith-Lever Act;" before the Georgia Educational Association on "Sending a College to the People;" before the Georgia Dairy and Live Stock Association on "An Experiment in Animal Husbandry," and before the State Horticultural Society on "Some Impressions of European Horticulture." Addresses were also delivered before the Atlanta Chamber of Commerce, the Atlanta Corn Show, the State Fair, and at Danielsville, Winder, Washington, Reidsville, Monroe, Barnesville, Greensboro, Tifton, Valdosta, Montezuma, Decatur, Commerce, Madison, Ashburn, Dublin and Sparta.

Needs of the College.

The rapid growth of the College is self-evident and naturally carries with it serious obligations to present and succeeding generations. A review of the reports submitted by the heads of the departments will show that several hundred students are now receiving instruction in each of these departments, and that the burden of teaching falls very heavily upon our men irrespective of the other varied duties which they are expected to discharge. I have previously called your attention to the overcrowded condition of our class room and laboratories, particularly the latter. We are without facilities to properly instruct the number of students registered at the present time without giving consideration to the normal increase we may anticipate from year to year. Classes cannot be sectioned with the present force of instructors, as it naturally doubles the teaching hours and would call for a decided increase in our maintenance funds. There are several essential departments of instruction in a well-organized agricultural college for which no provision whatever has been made, namely, farm management, agricultural bacteriology, agricultural botany, agricultural economics, and dairying. There is a distinct demand already for instruction in the subjects enumerated, and it is reasonable to suppose that these courses will be provided at an early date.

A most urgent need is a stock judging pavilion. The general interest in live stock husbandry requires that we offer adequate courses of instruction in this subject, yet the hundreds of men and boys enrolled as students during the past year had to sit out in the open without cover on improvised seats to receive this very necessary and essential information. When the weather is bad the class of necessity has to be abandoned, and the teaching work is seriously impaired on that account. This institution is one of the few which does not possess a satisfactory judging pavilion, and its importance is probablly best illustrated by the fact that a number of students narrowly escaped having pneumonia last winter as a result of exposure while attending the class in stock judging.

The farm mechanics department is badly overcrowded, and an addition to the present building is a most urgent need.

The two remaining units of the veterinary laboratory should be completed as soon as possible in order that a degree course in veterinary medicine may be provided for immediately. Inquiries are frequently received from persons who desire to specialize in this subject and at the present time are forced to leave the state to secure the necessary training. Surely this is a condition which should be remedied, especially as the amount of money needed for maintenance in view of the existing equipment and the correlation of this work with that of the College should not exceed $10,000.00 a year.

The Poultry Department needs another building, and the Mack property should be purchased, as previously pointed out.

The construction of a viaduct across Tanyard branch is an imperative need and would greatly facilitate communication between the College and the University proper.

A grounds house for the Department of Horticulture would be a valuable addition to the plant. Several more laborers' cottages must be erected as soon as practicable, and provision should be made for the establishment of a hog ranch. Much additional fencing is also needed to facilitate the transfer of live stock from one part of the farm to another without damage to growing crops.

Some provision must be made to take care of the extension department, which now employs 22 people with permanent headquarters at Athens. When the College was organized and its main building erected, it was not contemplated that the extension work would assume the proportions now witnessed. It is manifestly impossible to take care of the extension service and provide necessary offices, laboratories and class rooms within a building designed originally to take care of not more than 200 students.

The College has now been in existence eight years, and has received nothing from the state for buildings since the original appropriation of $100,000.00. Its growth is such as to justify the Board in asking for funds for the completion of units of the various buildings already begun, and for the housing of the Extension Department in a satisfactory manner. The economical thing for the state to do would be to appropriate $100,000.00 and put up another structure similar to the main building. If this cannot be done, however, at least $50,000.00 should be appropriated for the completion of buildings already commenced.

To provide for additional instructors, the proper sectioning of classes, and the support of a plant which has grown as rapidly as that of the Georgia State College of Agriculture necessitates an increase in our maintenance from $60,000.00 to $85,000.00. As already pointed out, $10,000.00 of this sum would be used for the establishment of a degree course in veterinary medicine, and $15,000.00 to provide for instructors, additional equipment, and contingent expenses.

Your attention has already been called to the fact that through the agency of the $40,000.00 now annually appropriated for extension work, Georgia is obtaining from direct and indirect congressional appropriations funds equivalent to $80,000.00; yet the various bureaus of the United States Department of Agriculture are constantly urging new projects upon us and offering to put up more money than we are now receiving, provided the state will bear a part of the necessary expenses. It is only reasonable, therefore, to ask for additional funds for extension work. At least $10,000.00 should be appropriated for soil surveys, $10,000.00 for extension work in agronomy, farm crops and farm management, and $5,000.00 for a teachers' training course in elementary agriculture.

The Smith-Lever fund must be offset if Georgia is to benefit from the provisions of this act. This will call for an appropriation of $25,174.00 for the federal fiscal year 1915-1916, and $46,151.00 for the year 1916-1917, over and above the present appropriations received by the College. Georgia is a rich state; one of the richest, in fact, in the Union. Agriculture is her predominating industry. The work of the College along lines of instruction, research and extension has demonstrated over and over again that the institution has returned to the state several dollars for every one it has ever received out of the treasury. Undoubtedly, an equally satisfactory showing can be made in the future. It is a suicidal policy, therefore, to withhold funds essential to progress from an institution such as this, and it is hardly just to Georgia to say that appropriations cannot be made because of the poverty of the state when its great wealth is self-evident and increasing with such amazing rapidity.

There are no doubt some who think that the College of Agriculture desires too much, more in fact than its share. An investigation of the situation will reveal that the requests made in proportion to the service rendered are very modest indeed, and that conservatism has been exercised in all particulars. But for the economic administration by your Honorable Body of the funds now available, the results witnessed could never have been attained. There is no disposition on the part of the College authorities to make a raid on the state treasury or to ask for unreasonable appropriations, but rather to seek a sufficient amount of money to enable the institution to develop uniformly and to discharge the duties incumbent upon it in a satisfactory manner.

It seems needless in this particular to again call your attention to the fact that the institution and its work have been endorsed most heartily by every class of citizens, including not only the active agricultural organizations of the state, such as the Dairy and Live Stock Association, the State Horticultural Society, and the Georgia Breeders' Association, but local chambers of commerce, boards of trade, the daily, weekly and agricultural press, and representative citizens in every walk of life. The business man, the thoughtful farmer and the progressive citizen generally appreciate the value of the service the institution is rendering and the reasonableness of the requests outlined above, and are heartily in favor of the proper endowment of any work calculated to advance our agricultural interests and place our primary industry on an efficient basis.

Student Interests.

With the largest enrollment in the history of the College, it is a pleasure to report that there has been comparatively little sickness and that the students have behaved in an admirable manner. The condition of the buildings and class rooms will show that they have exercised forethought and self-control. The Senior class has cooperated actively with me in advancing the interests of the student body. They have also aided in maintaining good order and discipline throughout the year, for as you no doubt remember, the students constitute a self-governing body, and up to the present time I have only had to express to the Senior class a wish or desire to have certain matters investigated or adjusted to secure their immediate consideration and prompt action.

The Agricultural Quarterly has been managed in an efficient manner and closed another successful year. The general excellence of the paper has been maintained and every financial obligation has been satisfactorily met.

The year is noteworthy from the standpoint of the student body by reason of the establishment of a triangular intercollegiate debate between the representatives of Southern agricultural colleges. The agreement for the present year was with North Carolina and Alabama. Debates were held at each of the three institutions, Georgia meeting Auburn at home and sending a team to North Carolina. Our students were fortunate in winning both debates, and are, therefore, entitled to hold for the present year a silver loving cup which the institutions are to pay for jointly and which becomes the property of any institution if won for three years in succession. I offer my congratulations to Professor Park and his colleagues, who coached our students. I am satisfied that the institution of this debating league will prove a worthy incentive to our students, and I, therefore, recommend that student activities of this character be encouraged in every legitimate manner.

The Georgia chapter of Alpha Zeta, an honorary agricultural fraternity, was established in the College during the year. Only Junior and Senior students of the upper two-fifths in class standing are eligible for membership. This fraternity is designed to establish and maintain high standards of scholarship. Its purpose is to recognize and reward worthy leadership in student life and activities. I feel sure the Georgia chapter will meritoriously represent the best ideals of this organization.

The students of the College have not given up their idea of erecting a club house. The financial situation has upset their plans temporarily, but it is still hoped that some patriotic citizen or some alumnus may see proper to donate a part or all of the funds needed for the erection of such a building, which would fill a long-felt want in the student body, provide a congenial meeting place, and establish a well-defined center for student activities on the property of the state.

Inventory.

The inventory for 1915 has been prepared with as much care as possible, and is presented for your information:

Land, 830 acres	$167,500.00
Main building	135,000.00
Houses on College property	4,000.00
Power house, including heating plant, light, water, plumbing, sewage, gas, sidewalks, etc.	33,250.00
Department of Agronomy, including barns, houses and demonstration field equipment	14,464.00
Photographic room	340.00
Department of Forestry, including Lumpkin Hall	11,003.65
Department of Horticulture, including barns, grounds and other equipment	19,615.19
Extension equipment and exhibit cases	3,823.11
Department of Agricultural Chemistry, including soil laboratory	6,549.80
Library	5,680.59
Department of Farm Mechanics, including laboratory	10,475.55
Department of Veterinary Medicine, including hospital and serum plant	19,110.30
Department of Poultry Husbandry, including buildings	10,417.00
Department of Animal Husbandry, including dairy	2,330.00
Live stock on farm	14,532.50
Farm buildings, barns and tenant houses	21,857.34
Tools and implements	2,877.50
Total	$482,826.53

The total value of the property is approximately $482,826.53. This represents an increase of $18,849.76 over 1914. These figures have been arrived at after allowing the usual percentage for depreciation. The value of the buildings owned by the College is well over $200,000.00. The several departments have assembled an equipment of considerable proportions. This, of course, includes special buildings, such as barns, field laboratories and apparatus essential to the proper organization of the work. The equipment of the Department of Agronomy is worth $14,464.00; of the Department of Horticulture, $19,615.19; of the Department of Farm Mechanics, $10,475.55; of the Department of Veterinary Medicine, $19,110.30; of the Department of Poultry Husbandry, $10,417.00; and of the Department of Forestry, $11,003.65. The value of the buildings, live stock and implements on the College farm amounts to $39,267.34, an increase of $8,501.09. The value of the land owned by the College has not been changed, and still stands at $167,500.00. In this statement no credit has been allowed for the betterment of the property due to the construction of improved roads. Five thousand dollars would be a very conservative sum to allow for this purpose. No credit has been assigned the farm for the improvement of the property for agricultural purposes, yet those familiar with conditions when work was started realize that the increase in this direction approximates several thousand dollars. These facts are cited, not only for your information, but to let you see that extreme conservatism has been exercised in the preparation of this inventory and that it is not exaggerated in the least. It shows that there is now under your charge property worth at least a half million dollars.

Resume.

Another year of constructive progressive effort has been completed. The College has grown and expanded uniformly during the last eight years along lines of instruction, research, and extension teaching until the results attained have surpassed our highest expectations. The personnel of the student body and their devotion to duty has been the subject of much favorable comment. The restrictive influence of insufficient funds with which to develop many lines of activity has been severely felt, but every individual and department has faced the situation with cheerfulness and the determination to achieve results worth while in the face of a difficult situation.

While the College needs many things there is nothing more imperative than an increase in its maintenance, so that the staff may be maintained at a high state of efficiency and sufficiently liberal salaries paid to insure the retention of the services of the best specialists in their respective lines of effort. The need of providing training for men capable of supervising the welfare of our live stock industries was never more urgent, and to this end, I desire to reemphasize the necessity of establishing a degree course in veterinary medicine at the earliest possible moment. The outbreak of foot and mouth disease in the United States last fall caused a loss of many millions of dollars, much of which might have been easily prevented had there been a larger number of expert veterinarians available. Trained experts in this field afford the only insurance we have for the satisfactory protection of an industry representing a hundred million dollars of farm capital. The losses from preventable diseases and injury in any Georgia county within a period of twelve months would more than offset the sum required to establish a degree course in veterinary medicine in this institution.

The betterment of the property from a physical point of view will no doubt appeal strongly to your appreciation of the aesthetic. The results attained are due largely to the completion of a well-ordered system of roads. While not so evident to the casual observer, the scientific equipment has also been developed in a marked degree. The farm is in good condition, and the grounds have been the subject of much favorable comment. Visitors have come in larger numbers than ever before. China, Japan, Russia, England, Germany and other foreign countries have all been represented by one or more professional or business men. As previously pointed out, some means should be provided for conveying them expeditiously over the property for reasons which need not be detailed.

The growth of the College in public favor is self-evident, and is emphasized by the constantly growing demand upon the staff for expert advice and information. Farmers are no longer satisfied with general statements, but are seeking the personal service and assistance of specialists. It is naturally impossible for the College with the limited number of men it employs to respond to the great majority of these requests, a situation which I keenly regret. Visitors from within and without the state who have inspected the institution have been kind enough to praise the method of organization which has been followed and the character of instruction offered. Our students seem fully capable of holding their own with those of other institutions and are apparently going forth imbued with a strong belief in the benign possibilities of agriculture as a profession. The very considerable percentage of them who are returning to the farm is encouraging, and the fact that the great majority have found profitable employment in Georgia must be gratifying to your Honorable Body as it is to the Faculty, for the institution can best serve the interests of the state through those trained graduates who become a part of the life of the respective communities in which they reside.

Your kindness in granting me a leave of absence to study and inspect agricultural conditions and institutions in Europe last summer was greatly appreciated. Fortunately, I was able to complete the greater part of my tour before the war broke out. I feel I was greatly benefited and was able to gather much information which can be utilized to advantage in the development of this institution. As in past years, the Chancellor of the University has given liberally of his strength and support to advance the best interests of the College of Agriculture. Only those who are intimately acquainted with the inside workings of an institution such as this and are familiar with the very large number of perplexing problems which come up for solution through administrative channels can fully appreciate what his sympathetic advice and encouragement mean. I desire to express my personal gratitude to him for his efficient aid and the generous support he has accorded me at all times. It can be truthfully said of him, "His life was gentle, and the elements so mixed in him that nature might stand up and say to all the world 'This was a man.' "

It is my painful duty to again report the loss of one of the Board's most esteemed members in the person of Hon. J. A. Thrash, of Greenville. Colonel Thrash died very suddenly on December 26th. As his colleagues on the Board fully realize, he took great pride and interest in the welfare of the College of Agriculture. He was a member of the Board from its first organization and a faithful attendant upon all its meetings. It is needless to point out that his wise counsel and advice will be greatly missed, and that all who had the privilege of knowing him will regret his untimely demise and fondly treasure their association with him in the storehouse of memory. The Governor appointed Hon. J. A. Gaston, of Greenville, to succeed Colonel Thrash.

Your kindness and consideration as a Board of Trustees have made my tenure of office very pleasant. You have generously supported the best interests of the institution and have given much of your personal time and effort to advancing its welfare. You have reason to view with pardonable pride what has been accomplished in the last eight years as a result of the wise policy instituted and promoted through your efforts. The success attained reflects great credit on your judgment and efficiency as a Board and shows that you have managed the affairs of the institution in a thoroughly businesslike manner. Your unselfish devotion to the cause of the College, its student body and staff has been widely favorably commented on throughout the state. I thank you for the kindness and consideration you have shown me at all times, and I trust I may be so enabled with your aid and advice to conduct the affairs of the College in the future as to insure the continuation of your confidence and esteem.

Very respectfully,

ANDREW M. SOULE,

President.

C
296 Za C
1915/16

Vol. IV. No. 18 JUNE, 1916 Bulletin 108

Bulletin
Georgia State College of Agriculture

UNIVERSITY OF ILLINOIS LIBRARY
MAR 6 1917

UNIVERSITAS GEORGIAE
1785

Annual Report
1915-'16

Andrew M. Soule, President

Entered as second-class matter December 21, 1912, at the post office at Athens, Georgia, under the Act of August 24, 1912. Issued monthly by the College.

Georgia State College of Agriculture

University of Georgia, Athens, Georgia

Administrative, Technical and Extension Staff

ANDREW M. SOULE	President
JOHN R. FAIN	Professor of Agronomy
MILTON P. JARNAGIN	Professor of Animal Husbandry
T. H. McHATTON	Professor of Horticulture
LEROY C. HART	Professor of Farm Mechanics
W. A. WORSHAM, JR.	Professor of Agricultural Chemistry
THOMAS W. REED	Registrar
WILLIAM M. BURSON	Professor of Veterinary Science
‡*J. PHIL CAMPBELL	Director of Extension
*GUY W. FIROR	Supervisor Extension Schools
JAMES B. BERRY	Professor of Forestry
‡*MARY E. CRESWELL	State Supervisor, Home Economics
*L. M. CARTER	Junior Professor, Soil Chemistry
*DAVID D. LONG	Soil Expert in State Survey
GEORGE A. CRABB	Junior Professor of Agronomy, In Charge of Soils
‡*JOHN K. GILES	State Supervisor, Agricultural Clubs
CHARLES A. WHITTLE	Editor-Librarian
*J. W. FIROR	Junior Professor of Horticulture
LOY E. RAST	Junior Professor of Agronomy. In Charge of Cotton Industry
ETHEL REESE	Secretary to President
*MARION W. LOWRY	Adjunct Professor of Soil Chemistry
O. T. GOODWIN	Adjunct Professor of Animal Husbandry
‡*JAMES E. DOWNING	Assistant State Supervisor Pig Clubs
‡*R. R. CHILDS	Scientific Assistant in Agronomy
*S. H. STARR	Adjunct Professor of Farm Management
*E. C. WESTBROOK	Instructor in Agronomy
EARL G. WELCH	Instructor in Farm Mechanics
‡*G. V. CUNNINGHAM	Assistant State Supervisor County Agents
‡*WILLIAM BRADFORD	Assistant State Supervisor Agricultural Clubs
‡*A. L. HIRLEMAN	Field Agent, Hog Cholera Work
*R. M. GRIDLEY	Field Agent in Animal Husbandry
‡*C. J. GOODELL	Scientific Assistant in Animal Husbandry
‡*G. L. BIGFORD	Scientific Assistant in Animal Husbandry
‡*F. H. DENNISS	Scientific Assistant in Dairy Husbandry
‡*W. H. HOWELL	Scientific Assistant in Dairy Husbandry
‡*D. J. TAYLOR	Assistant State Supervisor, Poultry Clubs
L. M. RODERICK	Instructor in Veterinary Science
‡*LOIS P. DOWDLE	Assistant State Supervisor, Home Economics
*PAUL TABOR	Instructor in Agronomy
WILLIAM S. DILTS	Instructor in Poultry Husbandry
‡*MRS. BESSIE S. WOODS	Assistant State Supervisor, Home Economics
P. O. VANATTER	Superintendent Field Experiments
A. P. WINSTON	Foreman of College Farm
F. W. CRYSLER	Foreman of Greenhouse and Campus
‡*F. D. GARRISON	District Supervisor County Agents
‡*W. F. WHATLEY	District Supervisor County Agents
‡*J. G. OLIVER	District Supervisor County Agents
‡*R. A. STRATFORD	District Supervisor County Agents
‡*L. S. WATSON	District Supervisor County Agents
*ELMO RAGSDALE	Field Agent in Horticulture
*GUY R. JONES	Field Agent in Agricultural Engineering
C. N. KEYSER	Tutor in Horticulture
OLIVE BELL	Clerk and Stenographer
*MRS. PEARL STOREY	Multigraph Operator
*NORA SAYE	Clerk and Stenographer
*ANNIE MAY PENLAND	Clerk and Stenographer
*MRS. E. T. EPPS	Clerk and Stenographer
AGNES HADDOCK	Clerk and Stenographer
*ELIZABETH DOWDLE	Clerk and Stenographer
MRS. MAY THORNTON	Stenographer

---

* In Extension Service.

‡ In Cooperation with U. S. D. A.

UNIVERSITY OF ILLINOIS LIBRARY
6 1917

Report of the President, State College of Agriculture and the Mechanic Arts

---

To the Honorable Board of Trustees
of the Georgia State College of Agriculture.

Gentlemen: It affords me pleasure to transmit for your information my ninth annual report on the work accomplished by the Georgia State College of Agriculture and the Mechanic Arts during the college year 1915-1916.

The depression witnessed a year ago has been greatly minimized by the comparatively good price which cotton brought on account of the reduction in acreage and a lessening in production due to the unseasonable weather which prevailed in several of the southern states. The remarkable vigor with which our people undertook to diversify crops the minute they recovered from the staggering blow which the outbreak of war in Europe inflicted upon them was most encouraging, and though the losses suffered were severe and the ordeal imposed a most trying one, farmers learned a thoroughly wholesome and much needed lesson. The good work begun in the fall of 1914 has been continued with the result that planters were more nearly able to live at home than was probably ever true in the previous history of the state. In this manner they were able to compensate themselves for some of the losses suffered in 1914, and to offset the reduction in cotton acreage in 1915. The records of the federal bureau of statistics indicate that in spite of unfavorable seasons, the diversification begun under such inauspicious conditions is likely to be continued, which leads to the belief that Georgia's agriculture has now been placed on a more efficient basis, and the future welfare of our primary industry materially advanced. A careful investigation shows that Georgia has already varied her crops more extensively than any other southern state, and while called on to meet a new crisis by reason of the recent boll weevil invasion, finds herself better prepared to face this menace successfully than has been true in the case of the states previously invaded.

The Georgia State College of Agriculture under the wise and efficient guidance of your honorable body, and through the active coöperation and assistance of the legislature, the federal government and the patriotic people of the state, has been instrumental in shaping the policy of our farm practice to a considerable degree, and the fact that Georgia has made commendable progress in the matter of crop diversification and in solving problems which threatened the prosperity of her people, leads to the belief that through the aid of science and education as related to agriculture she will be able to meet and overcome the difficulties and obstacles to progress which will necessarily arise in the not distant future.

Enrollment

The enrollment record has again been broken, which confirms the abiding faith of the people in technical education. The total number of students enrolled was 620. Of this number 203 were in the College of Science and Engineering and 419 in the College of Agriculture. The attendance upon the degree courses in the College of Agriculture again shows a satisfactory increase. The freshman class was by far the largest in the history of the institution. Much interest has been evidenced in the special and short courses. The graduating class contains a number of men of unusual ability, and the class of students entering the College in so far as preparation and individuality are concerned must be regarded as highly satisfactory. Few men are now seeking entrance who are not actuated by the desire to secure the largest possible measure of benefit from the courses offered. The raising of the entrance requirements and the constant improvement of the course of study have led to the general appreciation of the institution by educators and leaders of public thought, both within and without the state. The wisdom of the Board in insisting upon the recognition of scholarship and the attainment of high standards has thus been fully justified.

Student Enrollment by Years

Year	Long Courses	Short Courses	Total
1908	67	104	171
1909	62	124	186
1910	98	100	198
1911	115	110	225
1912	161	66	227
1913	185	165	350
1914	182	284	466
1915	191	350	541
1916	200	219	419
Total	1261	1522	2783

Increase in short courses in nine years	110 per cent
Increase in degree courses in nine years	195 per cent
Increase in all courses in nine years	143 per cent

Two hundred men are taking the long courses, and up to the present writing 219 have been enrolled in the short courses. With the approval of the Executive Committee the boys' and girls' short courses were transferred from January to August on account of the inclement weather which usually occurs in January, and because no adequate facilities for housing and caring for these boys and girls have as yet been provided by the state. Since three hundred scholarships have already been secured, the number receiving instruction at Athens will total well over 700, representing an increase of approximately 200 for the year. This does not include the 175 teachers in attendance upon the Summer School who were taught by members of the College staff, nor does it take into consideration the work done in teachers' institutes and short courses held in various parts of Georgia.

The advisability of conducting a better farming campaign throughout the territory not covered by county agents necessitated the temporary abandonment of the extension schools usually held each winter. The exhibit cars sent out, however, coupled with the active coöperation of the presidents and leading officials of the Southern, Central of Georgia, Seaboard, Georgia, Atlantic Coast Line, Georgia, Southern & Florida, Western and Atlantic, Louisville and Nashville, Augusta Southern, Georgia and Florida, Macon, Dublin & Savannah, Atlanta and West Point, Georgia, Florida and Alabama, Atlanta, Birmingham and Atlantic, and Georgia, Coast and Piedmont railroads, enabled our representatives to make 166 stops in 124 counties and meet 36,470 people, and thereby probably render a greater service than would have been achieved had ten or fifteen schools been held as usual at selected points. In performing this service our professors traveled 4761 miles, often on freight trains. The fine spirit with which they met and discharged every duty a train movement of this character imposes deserves recognition, and I commend them to your favorable attention on that account.

The holding of the short courses for boys and girls in August, together with the establishment of collegiate courses and the offering of instruction to summer school students, means that the library, laboratories and other facilities of the College are now used practically all the year around. Greater efficiency has been attained in the instruction of students of all grades, and it is self-evident in view of the number of students taught at Athens and in other parts of the state that our corps of instructors are actively engaged at all times. The increase in the short courses for the past nine years is 110 per cent; in the degree courses 195 per cent; and in all courses 143 per cent. More than 3000 persons have received instruction at Athens in the past nine years.

Alumni

One hundred men have received agricultural degrees since the College was reorganized. Twenty-three of these men hold commissions as county agents, exclusive of the present graduating class. Under the stress of circumstances it has been necessary to employ quite a number of men who have taken the one-year course, and in all thirty-eight men who have received training at the College are now assisting in the extension work. With one or two exceptions every graduate of the College is either farming or holding a position in which his time and effort are devoted to research or organization work pertaining to the advancement of our agricultural interests.

The funds available under the Smith-Lever Act are of such considerable proportions and calculated to increase so rapidly that the gravest problem now confronting the College is that of training and developing men and women with sufficient rapidity to enable them to fill acceptably the very responsible and difficult positions of county agent in agriculture and home economics. The attitude of the people has undergone a great change with reference to the graduates of the College of Agriculture, and in many counties where we are seeking to carry forward the coöperative extension work provided for under the terms of the Smith-Lever Act, an insistent demand has arisen for the appointment of our graduates. We, therefore, face the proposition of training in the shortest possible time at least two hundred and fifty men and women to discharge satisfactorily the duties of county agents and other work intimately associated with agricultural development. There is no line of education offering greater opportunities for service or advancement at the present time than that of agriculture, and while the growth in numbers of students has no doubt been gratifying to you, it is to be hoped that the young men and women of the state will realize the existing situation and take advantage thereof to the end that our attendance may be so increased as to enable us to turn out a sufficient number of experts to perform the service work devolving upon the College in a satisfactory manner. Our professors are offering a number of graduate courses as in the past, and we have several men enrolled therein. I am glad to report a growing tendency on the part of our own men to prepare themselves as efficiently as possible for the duties of leadership through the opportunity which our graduate courses afford them.

Summer Courses

The summer courses of collegiate grade inaugurated last year will be continued. These courses enable a number of worthy men each year to work off conditions or take up subjects in advance, thereby enabling them to graduate in three years. They permit men holding degrees from other institutions and who are at present employed as teachers, to secure special or advanced work. They will prove of special advantage to those men who may have received the B.A. or B.S. degree and desire to obtain the B.S.A. degree in two years. By the arrangement now made a number of men employed in the extension division will be permitted to take up graduate work during the summer when they secure their holiday leave. In accordance with the policy of the trustees, the cost of these courses has been reduced to a minimum, the students being asked to pay a tuition fee of $20.00 and a laboratory fee to cover the cost of materials and breakage of from $5.00 to $10.00.

Two courses in agronomy, one in animal husbandry, one in horticulture, two in agricultural engineering, one in veterinary medicine, one in agricultural chemistry, and one in poultry husbandry are offered. Those desiring to take up summer graduate work will be permitted to take majors or minors in farm management and animal husbandry. For the benefit of high school teachers and others who desire to secure special training, arrangements have been made to conduct courses in connection with the University Summer

School in elementary agriculture, high school agriculture, elementary field crops, soil fertility, manual training, landscape gardening and floriculture. The forest camp will be held at Margret, Ga., while the courses in cotton grading will be conducted as usual.

The European war has impressed upon every one the necessity of preparedness, particularly along agricultural and industrial lines. In spite of all that has been accomplished, our courses are still rather elementary in nature, and must remain so until the state is willing to increase our maintenance fund to the point where our professors may be encouraged to establish research work, thus providing facilities not now available for the advanced training of that small proportion of our students capable of doing investigational work of a high order. Whenever such an arrangement can be made, it will be possible to offer the doctor's degree in agriculture, and when we consider that one hundred million dollars are lost annually in Georgia by reason of the limited knowledge we possess concerning many fundamental matters, it would seem a good business policy on the part of the state to encourage the development of the highest type of leaders or public service experts in agriculture. A post-graduate division could be established to begin with at a cost not to exceed $10,000.00 a year. Germany has shown us how thoroughly a country with soils of moderate fertility and a rather unfriendly climate—from the standpoint of the agriculturist—has been able to mobilize her soil resources and thus feed her remarkably large population—area considered— successfully for a period of nearly two years when largely shut off from outside sources of supply. Her success in this direction has not been accidental, but has resulted from the most profound study of agricultural problems by the greatest savants of the empire. Many of these men have been specially commissioned and not interfered with for years that they might bring to light basic truths on which to predicate an advanced farm practice. Even if there had been no war, the benefits accruing to her industries and to her people can not be estimated. Her example should teach us to appreciate research at its proper value, and to so endow it in Georgia as to enable our people to enjoy the special advantages naturally conferred upon us by our soil, climate and favorable economic position.

Reports of Professors

The reports of the professors are herewith presented for your information. They indicate that service work of a high order has been performed by the members of the staff. The duties and responsibilities of professors and instructors alike grow more and more arduous. This is due to the expansion of our work at such a rapid rate and along so many lines. Not only has the increase in attendance imposed added burdens, but the demand for aid on the part of the people of the state grows more and more insistent. It is no easy matter to handle the correspondence alone since it is of such a varied nature, and one must of necessity be familiar with a wide range of subject matter pertaining to his specialty in order to answer it intelligently. The office hours of the institution are from 8:30 to 1:30 and from 3:10 to 6:00. These hours are carefully observed by the members of the staff, so you will see that our men are on duty for an unusually long time each day. In the laboratory courses, of which we of necessity have many, the professor carries an additional responsibility as he must arrange and provide for the material and equipment to be used in advance of the hour scheduled for his class. To some this may not appear to be a task of any moment, but in reaching such a conclusion, they display a woeful lack of knowledge. Since our men are required to give eleven months of service, they do not have as much time for recreation as many other professors, and in addtiion, the head of every division has some special line to which he must give a considerable part of his time, thought and energy if the work in his immediate charge is promoted in a satisfactory manner.

The statistical reports prepared show that the divisions are instructing from 100 to 190 regular students, which means that by classes some of them have as many as 250 or more regular students, and by subjects the equivalent of 903 students. Instruction is also given in the short courses, the number of students ranging from 63 up to 300. The burden of teaching work is thus seen to be very exacting, and in spite of the effort made by the Board to increase the number of assistants, we are still endeavoring to teach entirely too many men per instructor in both class room and laboratory. The divisions carry from 18 to 35 university hours of instruction per week, and this work is performed by one, or at most two to three men. The laboratory hours show a much higher total, and though the duties of laboratory instruction may not be as exacting as those of the classroom, the work of preparation and the constant supervision required and the examination of the records submitted equalizes the labor of the lecturer and the laboratory instructor.

The pleasant and happy relationships which have existed between the faculty and the executive office in previous years still continue. The professors have shown a truly gratifying interest in their work. They have offered many helpful suggestions, and have been ready at all times to perform any service no matter what the sacrifice involved might be which would further the interest or the welfare of the College, the student body, and the people of the state. I consider myself fortunate in being associated with the gentlemen who have charge of the several divisions of the College, and I feel sure that the excellent service they have rendered and the fine devotion to duty which they have displayed will not escape your favorable consideration.

Changes in Staff

There have been comparatively few changes in the staff, which leads to the conclusion that our professors and instructors regard their present positions favorably. This of itself is an evidence of the wise policies which the trustees have inaugurated in providing the largest measure of liberty for its employees consistent with good management. The loss of competent men from the staff is deplorable, and hence it is pleasant to observe that the corps of instructors and extension workers tends yearly to become more permanent in character. Our chief danger of losing men at present lies in the direction of the large salaries tendered them from time to time by other institutions. At best a professor's salary affords a limited income, and the fact that we have been able to hold the services of our men should not permit us to lose sight of the necessity of paying them as liberal salaries as possible and providing for their advancement in a manner commensurate with the service they render. Until the state is willing to provide an adequate maintenance fund for this purpose, it will not be possible to insure a desirable degree of permanency in our staff of instructors and extension workers.

Resignations

R. F. Irvin, instructor in poultry husbandry, resigned to accept a position with Rutgers College, New Jersey.

R. E. Blackburn, tutor in horticulture, having completed the work for his master's degree, withdrew to engage in farming for himself at Lafayette, Ga.

Appointments

Clarence N. Keyser, B.S.A., Pennsylvania State College, was appointed tutor in horticulture.

William S. Dilts, B.S., University of Michigan, was appointed instructor in poultry husbandry.

Mrs. B. S. Woods was appointed assistant state supervisor in home economics.

Elmo Ragsdale, B.S.A., University of Georgia, was appointed field agent in horticulture.

Guy Jones, B.S.A., University of Georgia, was appointed field agent in agricultural engineering.

S. H. Starr, connected with the agronomy division for several years, was placed in charge of the new department of farm management with the title of adjunct professor of farm management.

District and County Agents

The list of men and women county agents whose appointments have been authorized and confirmed by you is presented for your information.

G. V. Cunningham	Assistant State Supervisor	Tifton
R. A. Stratford	District Supervisor	Barnesville
W. F. Whatley	District Supervisor	Statesboro
F. D. Garrison	District Supervisor	Clarkesville
L. S. Watson	District Supervisor	Tifton
J. G. Oliver	District Supervisor	Americus

County Agents

County	Agent	Postoffice
Appling	Roy Rogers	Baxley
Bacon	B. J. Head	Alma
Ben Hill	J. T. Pittman	Fitzgerald
Bibb	W. G. Middlebrooks	Macon
Bleckley	M. G. Boland	Cochran
Brooks	S. Pedrick	Quitman
Bulloch	W. F. Whatley	Statesboro
Butts	G. E. Rice	Jackson
Camden	W. R. Smith	Woodbine
Campbell	S. M. Cown	Fairburn
Carroll	E. T. Jackson	Carrollton
Chattahoochee	C. M. James	Columbus
Clarke	J. G. Woodruff	Athens
Clay	G. T. Cassels	Fort Gaines
Cobb	W. F. Whelchel	Marietta
Colquit	V. B. Collier	Moultrie
Coffee	G. B. Eunice	Douglas
Coweta	J. H. Blackwell	Newnan
Crisp	J. A. Johnson	Cordele
Dawson	J. M. Turner	Dawsonville
Decatur	C. C. Lewis	Bainbridge
DeKalb	R. S. Hunter	Decatur
Dooley	C. B. Culpepper	Vienna
Dougherty	H. H. Parrish	Albany
Early	C. E. Martin	Hilton
Elbert	D. J. Pitts	Bowman
Emanuel	D. M. Treadwell	Swainsboro
Fayette	H. R. Harp	Fayetteville
Floyd	J. H. Foster	Rome
Franklin	C. A. Bryant	Royston
Fulton	T. G. Chastain	Atlanta
Glynn	J. L. Dunn	Brunswick
Gordon	G. F. Fears	Calhoun
Grady	P. H. Ward	Cairo
Greene	J. F. Hart, Jr.	Union Point
Habersham	F. C. T. Chandler	Clarkesville
Hancock	W. W. Driskell	Sparta
Harris	W. M. Boggin	Hamilton
Haralson	T. A. Hutcheson	Buchanan
Hart	E. C. Dillard	Henry
Hartwell	B. L. Hancock	McDonough
Houston	R. H. Howard	Perry
Jasper	B. E. McElheny	Monticello
Jeff Davis	Roy Rogers	Baxley
Laurens	J. B. Tyre	Dublin
Liberty	F. W. Ball	Hinesville
Lincoln	J. L. Burdette	Washington
Lowndes	S. L. Dowling	Valdosta
Madison	W. S. Long	Danielsville
Marion	Philip Rouse	Buena Vista
Milton	T. L. Parker	Alpharetta
Mitchell	G. C. Schempp	Camilla
Monroe	H. L. Worsham	Forsyth
Muscogee	C. M. James	Columbus
McIntosh	J. W. Arnold, Jr.	Darien
Oconee	J. G. Woodruff	Athens
Paulding	W. W. Yates	Dallas

Pickens	C. H. Cox	Jasper
Pierce	T. B. Wiley	Blackshear
Pike	R. A. Stratford	Barnesville
Quitman & Randolph	W. J. Boyette	Morris Station
Richmond	Gus York	Augusta
Stephens	H. G. Wiley	Toccoa
Stewart	W. S. Childs	Omaha
Sumter	J. G. Oliver	Americus
Taliaferro	T. L. Asbury	Crawfordville
Tattnall	O. T. Harper	Reidsville
Taylor	J. L. Turk	Butler
Telfair	Thos. Whatley	McRae
L. G. Proctor	Thomasville	Thomas
Tift	L. S. Watson	Tifton
Toombs	H. L. Cromartie	Lyons
Troup	L. C. Davis	LaGrange
Turner	R. P. Howard	Ashburn
Walker	A. C. Veatch	Trion
Walton	Eugene Baker	Monroe
Ware	E. S. Mann	Waycross
Warren	C. V. Shirley	Warrenton
Washington	S. H. Sherard	Sandersville
Wayne	J. P. Shedd	Jesup
Wilkes	J. L. Burdette	Washington
Wilcox	C. B. Davis	Rochelle

County Agents in Home Economics

Appling	Mrs. Frankie Parker	Baxley
Barrow	Miss Stella Pittman	Winder
Bartow	Miss Jessie Burton	Cartersville
Bibb	Mrs. Sadie H. Cheatham	Lorane
Bulloch	Mrs. Myrtle Odum	Statesboro
Butts	Mrs. Marye E. Butner	Jackson
Clarke	Miss Eldona Oliver	Bogart
Coffee	Miss Nola A. Johnson	Douglas
Coweta	Mrs. Eura J. Hyde	Newnan
Crisp	Mrs. R. M. Johnson	Cordele
DeKalb	Miss Julia Sewell	Decatur
Dooly	Miss Leta Wood	Vienna
Emanuel	Mrs. B. J. Sheppard	Swainsboro
Fayette	Miss Lela M. Dickson	Fayetteville
Floyd	Miss Ruth Salmon	Armuchee
Franklin	Miss Caroline Frankum	Martin
Fulton	Miss Hoyle Skinner	Atlanta
Gordon	Miss Woffie Floyd	Calhoun
Haralson	Miss Mary J. Stone	Tallapoosa
Harris	Miss M. Davison	Chipley
Hart	Miss Lizzie Leard	Hartwell
Jenkins	Mrs. E. T. DeLoache	Millen
Johnson	Miss Bonnie C. Fagan	Wrightsville
Laurens	Mrs. May E. Campbell	Dublin
Lumpkin	Miss Drusilla Ferguson	Dahlonega
Macon	Mrs. Kate W. Nelson	Oglethorpe
Muscogee	Mrs. E. G. Bond	Columbus
Pierce	Mrs. Annie W. Wiley	Blackshear
Polk	Miss Pauline Bailey	Cedartown
Rabun	Miss Maude York	Clayton
Stephens	Mrs. P. M. Allman	Toccoa
Stewart	Mrs. Tassie D. Clark	Richland

Sumter	Miss Ellen Brooks	Americus
Taliaferro	Miss Nada L. Rhodes	Crawfordville
Tattnall	Miss Maggie Bethea	Reidsville
Telfair	Mrs. Mary B. Wheeler	Milan
Thomas	Miss Lilla Forrest	Boston
Tift	Miss Rowena Long	Tifton
Turner	Miss Anne E. Rogers	Ashburn
Union	Miss Etta Colclough	Blairsville
Walton	Miss Eva McGee	Monroe
Ware	Mrs. T. B. Atwell	Waycross
Washington	Miss Mary E. Crowder	Sandersville
Wayne	Mrs. Annie Bennett	Jesup
Wilcox	Mrs. Annie L. Bethea	Pitts
Wilkes	Miss Mary C. Sayle	Danburg

College of Science and Engineering

For several years past I have uniformly recommended an appropriation for the College of Science and Engineering in order that a thoroughly up-to-date building might be erected and equipped for the more complete and satisfactory instruction of the students specializing in these subjects. In offering instruction in science and engineering, a costly and elaborate equipment becomes essential so that students may be satisfactorily trained for their life work and find acceptable positions upon graduation. The need of trained men in these particular lines was never more urgent than at the present time. The raw resources of our country are being wasted at an alarming rate and we must look to scientists and engineers to lead us in the vanguard of the fight which is now being waged for national preparedness. I feel that the state does not realize the existing necessity or a commodious building would be provided at an early date. The maintenance of courses in science and engineering is costly at best by reason of the expensive apparatus the student must work with and the large equipment required where laboratory courses are emphasized. At least $10,000.00 a year should be added to the maintenance fund of the College of Science and Engineering. This matter is of such importance that I feel it my duty to urge it upon the favorable attention of the Board as strongly as possible, and I hope that an appropriation may be secured in the immediate future for the purpose indicated above.

Library

The facilities of the library have been improved during the year in so far as our limited finances will permit. There are now 2880 bound books in the stacks exclusive of over 12,000 bulletins and pamphlets, representing the publications of the experiment stations, and various learned, scientific, educational and agricultural associations and organizations throughout the United States and Europe. A card index of the publications of the U. S. Department of Agriculture has been secured, thereby greatly facilitating reference work. This improvement, though not costly, has been one of marked advantage to both the professors and the student body. We are receiving 160 daily and weekly papers as exchanges for the publications and the correspondence sent out from the College. In addition 150 agricultural journals are received and are now on file in the reading room where they are constantly used by the students. Progress has been made in completing the file of experiment station bulletins so as to make them ready for binding in permanent and convenient form for reference use. Both the faculty and the students are using the library in a constantly increasing ratio, and as previously pointed out, the space available is now badly overcrowded and it is very desirable that arrangements be made for the enlargement of the library at the earliest possible moment. No healthier sign of growth is evidenced in any institution than through the constant use of the library by both professors and students for reference, research and study. The library is the servant of every one associated with the College; hence, its development is a matter of general concern. It is possible to add somewhat to the storage space for books by building a gallery around the stack room. The space congestion can probably be relieved to some extent by the removal of the veterinary department to the new veterinary laboratory building after July first as now contemplated. In view of the need of additional help in the library, I recommend that a fellowship be established in connection therewith to the value of $200.00 a year. Some deserving and capable young man can give some attention to the work of the library and at the same time pursue work for the master's degree.

Publications

The work of the editorial department has been vigorously prosecuted. Seventeen bulletins have been prepared in editions aggregating 101,000 copies and containing 708 pages. Thirteen circulars have been printed in editions aggregating 140,500 copies and containing 80 pages. Thirty-three thousand copies of six large posters have been distributed. Approximately 1,126,500 copies of bulletins and circulars have been issued in the past nine years containing 24,547,000 pages. The titles of the publications issued during the year are as follows:

Title	Edition	Pages per copy	Total pages
Sixth Annual Report of District Agricultural Schools	2000	32	64000
Analysis of the soils of Troup County	1500	32	48000
Analysis of the Soils of Jones County	2500	64	160000
Correspondence Courses in Agriculture—Farm Forestry, Parts 1 and 2	2000	16	32000
Growing Irish Potatoes in Georgia	10000	12	120000
Poultry Houses for Georgia	10000	12	120000
Announcement of Short Courses	3000	16	48000
Farm Management Under Boll Weevil Conditions	10000	16	160000
Analysis of the Soils of Stewart County	2500	60	150000
Forest School Announcement	1000	20	20000

Boys' and Girls' Club Work— A Manual for Rural Teachers	15000	52	780000
Announcement of Veterinary Degree Course	1500	12	18000
Catalogue	3000	100	300000
Boys' Pig Clubs, 1915	5000	16	80000
Girls' Club Work, 1915	5000	16	80000
Farmers' Conference Report	2000	200	400000
Home Canning of Fruits and Vegetables	25000	32	800000
Home-grown Foodstuffs for Georgia	25000	8	200000
Beginnings with Live Stock	25000	4	100000
Boys' Corn Club Work, 1915	20000	8	160000
Possibility of an American Source of Potash	10000	4	40000
Rock Phosphate	10000	4	40000
Corn Cultivation	15000	8	120000
Lime and Its Relation to Potash	5000	4	20000
Peanut Oil Production in Georgia	5000	4	20000
Cotton Variety Tests, 1915	5000	4	20000
Poultry Clubs, 1915	5000	8	40000
Summer Courses in Agriculture	2500	8	20000
Growing Sweet Potatoes in Georgia	10000	8	80000
Announcement of Boys' and Girls' Short Courses	3000	8	24000
Total	241500	788	4264000

Editorial Department

Bulletins and circulars were printed in editions twice as great as that of any previous year; yet the supply has already been exhausted in the majority of cases, and farmers, business men, bankers and others are asking for the reissuing of some of these reports on a larger scale than ever. The funds available for printing have been increased uniformly from year to year, but in spite of this fact are still inadequate to satisfy the needs and requirements of Georgia farmers. This it seems to me is a deplorable situation and one which should be remedied in the interest of the state, for undoubtedly the reading farmer becomes an aggressive factor in his community, and an introducer and disseminator of new methods of practice and facts of essential importance tending to the betterment of our agriculture.

The plate matter distributed to the weekly press of the state has been continued. It is now being used by 150 papers. The amount sent out is the equivalent of 4500 columns of printed matter and has appeared in at least nine million copies of Georgia papers. The editors of the weekly press are loud in their praises of this plate matter and insist on being provided with it for every issue during the year. At present we are only able to send out a column for the equivalent of about thirty issues. Since it costs but twenty-five cents per column delivered and we have the facilities to prepare it at our command, the request is reasonable, and would be gladly complied with but for financial reasons. This situation should be remedied for in coöperating with the weekly press in the manner indicated, the College is enabled to specifically advise farmers every week about questions of vital importance. You may be interested to know that it was through the efforts of the College that the plate service was held to be a proper charge against Smith-Lever funds, and that this method of distributing agricultural information now so generally used in a majority of the states originated here. The news service to twelve daily papers has been carried on successfully, more than sixty items have been sent out. An information service for the daily papers has been established but is still in its experimental stages. A farm service for the use of daily papers has been started, two columns of matter being released for use each Monday. A circulation of 150,000 copies a week has already been attained.

Boys' and Girls' Short Courses

The short courses for boys and girls will be held in August. Provision has been made for a highly specialized course of instruction. It is planned to house the boys and girls in the University dormitories and board them in the dining hall. This arrangement has been perfected through the courtesy of Dr. R. E. Park and Dean C. M. Snelling, and will lessen the cost of maintaining the boys and girls while in Athens and afford them advantages which they could not obtain in any other way. These young people represent the pick of the communities from which they come and have all been awarded scholarships because of the exceptional records made in the production of corn, pork, poultry, and the growth and canning of garden crops. They come essentially from the open country, and it is a distinct privilege for the institution to have this opportunity of serving them in the manner indicated. It means that through their efforts infection spots will be created here and there throughout the state, and that the inspiring influences they take back to their home communities are destined to exert a marked effect on the progress and development of our farms and homes along constructive and uplifting lines.

Scholarships to the value of $25.00 have been offered by the following: Georgia Bankers' Association 30; Georgia Railroad 19; Southeastern Fair Association 19; State Fair Association 14; Atlanta, Birmingham & Atlantic Railroad 12; American Coal Products Co. 12; Georgia, Southern & Florida Railroad 11. In addition approximately 180 scholarships have been given by business men, county boards of commissioners, county boards of education, and county and district fairs. The value of the premiums awarded in the club contests in 1915 was $13,500.00, and the amount will be greater in 1916. Statistics show that every conscientious student entering a university has his earning power increased by twenty dollars a day for every day of the four years he is ordinarily in College. This amounts to $24,000.00 for his life earning period. If these boys and girls coming in contact with the inspiring influences which the university and the college afford are only benefited to the extent of $1000.00 during their life period as a result of attending the short courses, $300,000.00 will have been added to their life earning capacity, a sum which it would seem is well worth considering, and if courses of this character can be continued and enlarged from year to year, the benefits accruing to the state in the aggregate will ultimately amount to a very large sum.

Conference for Farmers

The Georgia Dairy and Live Stock Association, the State Horticultural Society and the Georgia Breeders' Association held their annual meetings at the College in January. The program was so adjusted that the men and women county agents here in annual session for a period of two weeks' training and instruction, were enabled to hear the addresses delivered by the principal speakers. There seems to be a feeling on the part of some of these associations that they could advantage themselves by holding their meetings elsewhere. In view of this sentiment, the College officials gladly acquiesced in the proposed arrangement, believing that in so doing they were carrying out the wishes of the trustees to the effect that the College has no selfish ends to serve in this matter, but is actuated solely by the desire to promote the welfare of these organizations and the interests which they represent. In accordance with your advice, the programs of these societies have been printed and distributed, the traveling expenses of the speakers brought from a distance paid, and the proceedings of the meetings printed. I feel that we have extended them every possible courtesy, and while we should be glad to have them continue to make their headquarters here, they naturally are at liberty to go elsewhere whenever they feel that it will be to their interest. We are indebted to the following gentlemen who came from distant points to deliver addresses before the different associations without remuneration save for their traveling expenses: Dr. H. H. Love, of Cornell University; Mr. C. B. Smith, in charge of farm management investigations for South Carolina; Dr. W. E. Hinds, State Entomologist of Alabama; and Dr. Carl W. Gay, of the University of Pennsylvania.

As in the past, Prof. Jarnagin has acted as secretary of the Georgia Dairy and Live Stock Association; Prof. McHatton of the State Horticultural Society; and Prof. Rast of the Georgia Breeders' Association. They have performed the duties which these offices impose upon them with cheerfulness and dispatch, and have rendered a valuable service, not only to the institution, but the organizations which they have served so successfully. The usual buffet luncheon was given the visitors. This was made possible through the courtesy and coöperation of a group of Athens' leading citizens who contributed the funds for this purpose. The luncheon was prepared and served under the direction of Miss Mary E. Creswell and the county agents in home economics. Fully five hundred persons attended the various conferences.

District Agricultural Schools

The annual meeting of the district agricultural school principals was held in the executive office of the State College of Agriculture at ten o'clock, Friday morning April 28th. Eight of the principals were present. After consultation with the members of the several departments of the College, it was agreed that no change be made in the course of study as now offered with but one slight exception. Plans were discussed for the purchase of textbooks for the schools so as to reduce the cost to the students. Various heads of the College divisions offered to aid the schools in the matter of buying second-hand books, beautifying the grounds, purchasing live stock and laboratory equipment, and in other directions. It was agreed that students expelled from one district school should not be permitted to enter another. Progress was made in the matter of locating district agents in extension work in association with the schools in accordance with the suggestions contained in Section 7 of the Act creating them. Reports from the various schools indicated that considerable progress had been made in improving the physical and chemical equipment, and that much work was being done looking towards the enlargement of the agricultural lbaoratories and the improvement of the herds and flocks. Emphasis was laid on the necessity of developing teacher training courses in connection with the schools. Commendable progress has been made in this direction by the Fifth District School located at Monroe in charge of Principal Walker. It appears that the schools should in a short time be able to turn out a very considerable number of teachers each year better qualified to serve the needs of the rural schools than any instructors available at the present time. A resolution was passed asking that Mr. T. W. Reed, treasurer of the College, be requested to make monthly requisition upon the Governor of the state for the funds appropriated to the eleven district agricultural schools, and that these funds be transmitted by him to the treasurers of the respective schools. At the suggestion of Mr. J. W. Stephens, State School Auditor, a uniform system of accounting was agreed upon, the plan to be followed to be prepared and submitted to the principals by Mr. Stephens.

The first annual literary and athletic meet of the schools was held at the College on April 28 and 29. Seven of the schools were represented in these contests and eighty-six boys and girls participated therein. The events were all keenly contested and the boys and girls made a creditable showing. The subject debated by the contestants, "Resolved, That the boll weevil will be a benefit to Georgia," resulted in enlightening hundreds of people about this important matter and directed unusual attention to the schools and to the fine character of the training afforded the boys and girls in these institutions. Medals were awarded to the winners of the various events through the courtesy of the Virginia-Carolina Chemical Co. They were made of gold, being wrought out in the pattern of the seal of the University of Georgia. An enamel band encircled the outer edge of the medal, the top part of which was red and the lower black to represent the University colors. On the top of the face the following legend appears, "Georgia A. & M. School Association," and on the bottom, "State College of Agriculture." The event for which the medal was awarded was engraved on the back thereof. They were designed to be worn as a fob by the boys and as a pendant by the girls. The contest was a success from every point of view and was enthusiastically commended by the principals present and the College asked to make it an annual event, which of course, will be gladly done as it presumably meets with your approval. A luncheon was provided for the visitors on the last day of the contest.

Extension Division

Meetings were held during the past year to the number of 3687, as shown by the following table:

Kind of Meeting	Number	Counties	Attendance	Miles traveled
Field Meetings	61	61	12617	11673
Hog Cholera Control	164	148	31216	28041
Live stock Campaign	166	124	36470	4761
Motion picture Tour	64	24	10000	2488
Pig Club meetings	371	14	20060	14846
Teachers' Institutes	14	12	1090	1709
Poultry Club meetings	48	10	4719	9431
Live Stock meetings	55	36	18732	6245
Girls' Club meetings	1658	41	88540	62308
Corn Club and Demonstration meetings	1036	124	101800	233919
Miscellaneous Meetings	45	45	7405	3854
Educational exhibits	5	5	100000	4200
Total	3687		432649	383475

The members of the instructional force of the College participated in many of these meetings. Field service of this character must be regarded as one of the most important features of our extension activities because of the opportunity which campaigns such as those inaugurated and carried on afford of presenting essential and graphic facts to the people who attend these gatherings. A summary of the attendance upon train movements, extension schools, field meetings and other gatherings held under the auspices of the College during the past nine years is presented for your information:

Extension Attendance Summary Educational Trains

Year	Number Meetings	Attendance	Miles Traveled
1908	150	150000	5000
1911	158	350000	5500
	Extension Schools	Field Meetings, etc.	
1908	42	10000	15400
1909	144	17330	35500
1910	200	42200	85900

1911	209	47261	95700
1912	479	98470	109730
1913	1096	120156	139660
1914	949	218063	188300
1915	1752	228608	188666
1916	3687	432649	383475
Total	8866	1714737	1252837

The above record shows that 8866 meetings have been held with a total attendance of 1,714,737. Our workers have traveled 1,252,837 miles to carry information and advice on agriculture into every part of Georgia.

DEVELOPMENT OF THE CLUB WORK.

The club movement commenced so inauspiciously in 1906 has now become one of the strongest and most important features of our extension service. Our experience has beautifully exemplified the suggestion that adults can best be reached through the boys and girls. Georgia was the first state to establish boys' corn clubs on the basis now followed in practically all the other southern states. The growth of the club work has been truly remarkable since it was first established ten years ago, and its expansion has been uniformly rapid since the coordination of our efforts with that of the U. S. Department of Agriculture in 1909 and by reason of the enlarged appropriations made available under the Smith-Lever Act. There are now about 8500 members of the corn clubs distributed through 142 counties. There are 2500 members of the pig clubs, 1500 members of the poultry clubs, and 5000 members of the canning clubs. One thousand boys are enrolled in the four-crop clubs, and 2000 in miscellaneous clubs. The total number of boys and girls engaged in carrying forward the banner of farm and home improvement number 20,000.

The good accomplished through the agency of the club work can not be correctly estimated. The Hon. M. L. Brittain, State Superintendent of Schools, will not issue a certificate to what he terms a standard rural school until it has established some form of club work. It has always seemed wise and proper that the club movement should be coordinated with that of the schools, thereby strengthening both organizations and bringing about a mutual correlation of effort. The teachers have experienced some difficulty in determining just what to offer the club members in the way of helpful suggestions. To this end a Teachers' Manual on Boys' and Girls' Club Work has been prepared and widely distributed. It has been used with effect at many teachers' institutes, and superintendents and other educational leaders have been kind enough to say that it has aided them materially in improving the character of instruction offered in elementary agriculture and home economics. It is certainly very desirable that a pamphlet outlining a course of study in elementary agriculture for both urban and rural schools and amplifying the data set forth in the bulletin to which reference has been made be prepared as soon as possible. Such a monograph would be invaluable to teachers of agriculture, and the College through its division heads is in position to prepare the subject if the state is willing to provide the funds for printing and distributing it in pamphlet form. It should not be difficult to accomplish this very desirable end since it would not cost more than $2500.00 to print an edition large enough to place one in the hands of every teacher in Georgia.

Some examples of the benefits accruing to the people of Georgia through the club movement may not be inappropriate. More than fifty boys made over 100 bushels of corn in 1915 at a cost of less than thirty cents per bushel. Elsworth Watkins, of Jackson, made the highest yield in 1915. He grew and harvested 166.7 bushels of corn from an acre of land at a profit of $137.49. This boy accomplished a feat which if performed in some other vocation would be loudly acclaimed and have won for him no doubt a distinction of the highest order. Is he not as deserving as those who have achieved success in other fields of human activity, and is it not possible to provide in some way for the recognition of merit in agriculture as well as in industrial pursuits. Ten years ago many farmers said corn could not be grown profitably in Georgia. It is interesting to observe, therefore, that the average yield of the state has been increased about 4.5 bushels per acre in the period indicated. Last year 2210 boys grew 95,000 bushels of corn on their acre plats. This represents an average of 43 bushels per acre and was raised at a cost of 42 cents per bushel and at a profit of $55,117.40. It is possible to secure an average yield of 43 bushels per acre on at least one million acres of land now devoted to the growth of corn in Georgia and which at present is yielding about 15 bushels per acre. The results obtained have surely changed the farmers' attitude. Optimism has replaced pessimism, new standards have been established, and a breadth of vision attained which makes for progress. The boys and girls have discovered in some measure the possibilities of the open country. They have learned to study and respect the soil and have come to appreciate in an elementary sense at least the necessity of farming with brains rather than with brawn. Surely this has been well worth while, quite aside from financial advantage the encouragement of corn production has wrought in the state.

Not only have the boys grown corn, but those who have reached the age of eighteen have been encouraged to take up what is known as the work of the four-crop clubs. There were 929 members enrolled last year. These boys practice a rotation and grew cotton, corn, oats and hay on individual acres. In 1915 they made the yields and profits shown below:

	Average yield per acre		Average profit
Cotton	1675 lbs.		$28.06
Corn	55.1 bu.		36.27
Hay	3197 lbs.	$24.53	45.55
Corn	37.8 bu.	21.02	
Total profit on three acres			$109.88

The club work is therefore becoming progressively effective and leading the boys from simple beginnings to the establishment of an agricultural practice on a thoroughly scientific and fundamental basis. What does their participation in the agriculture of Georgia presage for the state in the not distant future?

The girls' canning clubs, now known as home economics clubs, were first established in 1912. Nearly 4000 girls were enrolled in 1915. They put up 1,200,000 pounds of canned goods from their tenth-acre gardens and used for this purpose 332,240 containers. The value of the canned goods grown by these girls totalled $29,588.00. The average cost of growing the crop was $5.78 and the average net profit per garden $15.05. These girls kept careful records and also presented an exhibit of the finished product at the county school fair. Thus, close observation of business principles, system, accuracy of detail, skill and sanitation are all impressed on the minds of these young people. Jennie Nichols, of Floyd county, raised 5460 pounds of tomatoes on her garden plat at a profit of $88.50. The state is to be congratulated on producing a young woman who has won her economic freedom and demonstrated her capacity for leadership without the ballot.

Who can question the value of work of this nature in building up and developing the body, mind and spirit of these young people. Most persons do not realize what they are capable of accomplishing until circumstances force responsibility upon them. These boys and girls, often surrounded as they are by an atmosphere of pessimism, would never have been able to find themselves but for the inspiration which the club work has brought to them. As well try to dam the raging torrent at the height of its flood tide as to stop the influence for good radiating from the aroused intellect of the boys and girls of Georgia. What more fundamental or serviceable undertaking can be accomplished than that of arousing the perception of youth at the crucial moment; of letting them see and realize early in life that through intellectual development they may achieve great success; that it is not necessary for them to work and drudge away their lives without making any progress. If it is possible through the agency of these boys and girls to break down prejudice and let in the light of understanding as it pertains to the relation of science to agriculture, the future prosperity and success of the state is assured, and I, personally, am one of those who believe that at least a substantial beginning has been made in the right direction through leading the boys and girls of Georgia to a better understanding and appreciation of the relation of water, soil and plant food to crop production.

Home-Building Activities

Through the acceptance of the Smith-Lever Act new responsibilities and duties have been imposed upon our extension division, and none of these are more important than that of employing county agents in home economics to advance, not only the welfare of the girls through club organizations, but that of the adult women of the state through directing attention to the important matter of home improvement. The 49 women agents employed at the present time are engaged in an undertaking which embraces all the activities which may be properly correlated under the general head of home economics, and which naturally concern every phase of the home life of our people. Work of this character was begun in 1915. Our women agents have proven enthusiastic and efficient and have accomplished a great deal in the face of the most trying situations. Can you imagine what a load of responsibility these agents must bear in endeavoring to deal with the variety of problems by which they are confronted in the execution of the daily routine of their work. If the tasks seem easy, sit down and reflect over them for a moment. Women who are not possessed of high educational qualifications and the true missionary spirit, and who are not willing to work under the most discouraging circumstances and exercise a real spirit of self-sacrifice, can not hope to succeed as county agents.

As in other lines of extension work, certain specific things have been undertaken. In the beginning an effort has been made to secure the screening of houses against flies. The fireless cooker and iceless refrigerators have been introduced into hundreds of homes. Thousands of canning and preserving demonstrations have been made to encourage the saving and storing of fruits and vegetables for winter use, thereby enlarging the dietary of the family and lessening the tendency to disease, particularly pallagra. As an evidence of what is being done in each of the 49 counties an endeavor has been made to summarize in some measure the work accomplished by one of these agents, and I present the same in condensed form for your information:

Report of Mrs. E. C. Bond, County Agent in Home Economics, Muscogee County, Georgia.

Number of women enrolled in home demonstration work---	125
Number of girls in garden and canning club work--------	75
Number of county meetings held----------------------	24
Total attendance ------------------------------------	1000
Number of community meetings held-----------------	34
Home demonstrations in cooking, dairying, spraying, etc--	28
Home demonstrations in preparing lunches, salads, bread, etc.	100

Labor-saving devices installed in home:

Fireless cookers	50	
Iceless refrigerators	15	
Fly traps	20	
Wheel trays	2	
Screens in houses	12	
Cleaning devices	10	
Dairy appliances	20	
Home waterworks	5	
		134

Bulletins on dairying, poultry management, gardening, canning, cooking, etc. distributed	600
Pounds of vegetables canned for winter use	22942
Total value of vegetables from club gardens	$604.32
Pounds of berries, peaches, figs and pears canned	4000
Cost of production per one-tenth acre garden	$4.00
Profit per one-tenth acre garden	$20.00
Highest value per one-tenth acre garden (Cost $15.30; net profit $58.30)	$73.60
Number of girls who made caps and aprons for use in demonstrations	50
Number of clubs which held regular meetings throughout the year	10
Number of winter garden demonstrations	12

A model kitchen has been established in connection with the rest rooms in which lessons in cooking are given every Saturday. This was the means of bringing together producer and consumer with the result that our girls sold all surplus products direct to consumers. An agricultural library of bulletins and all modern dairy utensils were placed in the rest room.

Work of the County Agents

The title of our field representatives has been changed to that of county agent. This work was formerly carried on coöperatively with the Office of Farmers' Coöperative Demonstration Work but has now been merged with the States Relations Service. This is the bureau of the U. S. Department of Agriculture charged with supervising the Smith-Lever Act from the standpoint of the federal government. While the funds accruing to Georgia through the Office of Farmers' Coöperative Demonstration Work are still available, the coördination of the energies of the state and federal agencies has proven very acceptable. By this arrangement all the federal bureaus have been brought into closer relationship with each other so that all extension work conducted by the U. S. Department of Agriculture is now centralized, supervised and primarily directed in Georgia through the State College of Agriculture.

At present 83 supervising and county agents are employed. These men or working in 89 counties. You will thus see that ten additional counties have been taken on since last year and an examination of the organization will show that it has been generally strengthened. The personnel has been improved and you have reason to feel proud of the good work accomplished by our agents. It is desirable that the character of training and qualifications of the agents be advanced from year to year. Of course, the demand for agents has been such that it has been extremely difficult to find adequately trained men for this important service, and this is likely to continue to be the case for some years to come, or at least until the young men of Georgia realize the opportunity which a position as county agent affords them to do essential service work for their state, and therefore, undertake to qualify themselves in sufficient numbers to meet the demand. The effort of both men and women agents is correlated to a certain extent so that they can facilitate the service work carried on by each other and obviate duplication of effort. Men and women agents not only promote the club work but carry on active service work with adults singly or in groups or through what are known as farmers' clubs. At present there are some 2000 members of adult clubs in Georgia and this movement is rapidly growing. There seems no way of insuring more rapid development of the open country than through the establishment of community clubs to act as social centers and as small clearing houses for the buying of such things as may be necessary and the sale of the products of the farm and the home. It is believed that substantial progress will be made another year in the organization of clubs of this character. Like every other movement, it has taken some time to get it under way, but now that a beginning has been made, a rapid growth is anticipated. The agents have 21,461 farmers enrolled as demonstrators and coöperators. When this number is added to those enrolled as club members, it will be seen that our field representatives are now working with more than 42,000 individuals. These people have a new purpose in their hearts and are moving harmoniously forward in the lockstep of progress.

Last year the adult demonstrators grew 15,105 acres of corn with an average yield of 40.1 bushels per acre; 6396 acres of cotton with an average yield of 1315 pounds of seed cotton per acre; and 7712 acres of oats with an average yield of 52 bushels per acre. Compare these figures with the average for the state and see the influence for agricultural betterment which has been conferred on these farmers through the work of the county agent. In addition, the agents were responsible for the seeding by improved methods of 2639 acres of clover, 4013 acres of wheat, 1085 acres of peanuts, 861 acres of rye, 3040 acres of cowpeas, 126 acres of vetch, 759 acres of soy and velvet beans, and 750 acres of hay crops. The agents also aided in the establishment of 10,402 acres of pasture land, 10,953 gardens, in the preparation of 62,200 tons of fertilizers, and the pruning and spraying of 4115 acres of orchards. They have encouraged the stumping of 50,920 acres of land, the terracing of 2350 acres and the drainage of 800 acres. They are also largely responsible for the purchase of $500,000.00 worth of improved machinery. Through their efforts 1569 purebred cattle, principally of the beef breeds, have been brought into the state. Advice has been given relative to the purchase, feeding and management of thousands of beef and dairy cattle and hogs. At least 50,000 hogs have been inoculated with preventive serum, thus effectively controlling the spread of swine plague, and encouraging the development of this industry on a basis somewhat commensurate with Georgia's need. One hundred and twenty-eight modern farm buildings have been erected through their influence, as well as 262 silos and 619 dipping vats. Waterworks and lighting systems have been installed in 350 homes and telephone connections placed in 300 more. Groups of farmers have been organized into 77 local coöperative clubs, 48 county or school fairs promoted, and 255 special meetings held. The agents have made over 3100 visits to the schools and met personally 49,000 teachers, parents and pupils. They traveled in their own conveyances 335,000 miles.

These figures should convince the most uncharitable, but since few persons realize the extent of the public service work performed by a county agent, for your information I present a summary of one agent's activities during the past year:

Summary of Work Accomplished by L. G. Proctor,
County Agent for Thomas County
May 15, 1915—May 15, 1916.

Miles traveled	12780
Demonstrators visited and advised	780
Coöperators visited and advised	327
Registered bulls purchased	4
Registered hogs purchased	120
Registered sheep purchased	10
Coöperative spray pumps purchased	5
Acres drained	70
Number of farms terraced	9
Organizations effected:	
Farmers' Community Clubs	11
Country Produce Exchange	1
Sanitary Dairy Association	1
Canteloupe Growers' Association	1
Hogs inoculated with preventive serum	4971
Sick hogs inoculated	400
Number of sick hogs which died	131
Number herds inspected for cholera	149
Post mortem examinations held	171
Sick animals treated	8
Farmers advised as to feeding of live stock	71
Farmers advised as to seed selection	11
Members of corn clubs	86
Members of pig clubs	176
Highest yield of corn per acre in county	70.5
Silos erected	9
Concrete hog vats built	41
Plans submitted for hog tonic hoppers	75
Bermuda, bur clover and lespedeza pastures planned	19
Barn plans submitted	8

Acres set to peaches	140
Orchards pruned	3
Orchards sprayed	11
Orchards inspected and owner advised as to care	17
Tons of lime secured coöperatively for farmers	760
Demonstrations established in alfalfa	7
Acres planted to alfalfa	75
Acres planted to crimson clover	25
Acres planted to bur clover	100
Inoculation demonstration held	4
Acres on which inoculating material was used	100
Public meetings held	12
Attendance	1350
Farmers' Community Club meetings held	45
Attendance	675
Farmers advised in office or over phone	425
Newspaper articles prepared	17
Letters written to farmers	390

The figures presented in this summary show the potency of the county agent in aiding the farmer in organizing his business along constructive and permanent lines. This man's salary is $1500.00 a year, and he has been worth at least $25,000.00 to the farmers of the county in which he has worked.

Prizes, Scholarships and Gifts

The College has received quite a number of contributions during the year for prizes and scholarships. A proportion of the funds donated are to be held in trust on a basis similar to that provided for under the Brown Fund endowment. The recognition of the institution by the various organizations and individuals concerned is gratefully acknowledged. It indicates their belief in the fundamental nature of agricultural education and their willingness to aid worthy young men to secure an education and thereby prepare themselves for leadership along agricultural lines. The chief contributors are as follows: The Virginia-Carolina Chemical Co., $500.00; The Southern Railway Company, two scholarships, $500.00. This company has also set aside $1000.00 to be held as a trust fund, the interest thereof to be used for loaning to students. The fund is to be known as the William Wilson Finley Foundation in memory of the former president of this road. The Cotton Seed Crushers' Association and the American Coal Products Co. have given their usual prize of $25.00 each; and H. G. Hastings & Co. have continued their prize of $20.00. The Georgia Bankers' Association has contributed $1350.00 to be used as loans to worthy students. The beneficiaries of this fund must register with the College authorities and be nominated by them to the agricultural committee of the Georgia Bankers' Association. They must be prepared to enter College and they must secure the endorsement of the leading bankers from the section of the state in which they reside.

Thirteen young men have obtained loans from the Bankers' Association up to the present time, and I am glad to say that with but one or two exceptions they are doing excellent work. The Bankers' Association is also contributing thirty short course scholarships of the value of $25.00 each, fifteen for boys and fifteen for girls. The liberality of this organization can not be commended too highly, and the institution is certainly under a debt of gratitude to the Hon. B. W. Hunt, of Eatonton, and his associates of the agricultural committee of the Georgia Bankers' Association who have been in large measure responsible for the establishment of the various scholarships enumerated above. Short term scholarships to the value of $1568.50 have already been forwarded to the treasurer. There will be about three hundred of them worth $7500.00 altogether.

Contributions for the support of men and women county agents have been paid into the treasurer to the amount of $2638.82. The State Fair at Macon has contributed $1300.00 towards the maintenance of county agents, as scholarships and prizes, and for the installation of the College exhibit made at Macon each fall. The Southeastern Fair Association has contributed $1000.00 towards the maintenance of extension work. The total gifts and money from all sources therefore approximate $10,310.32, exclusive of the short term scholarships still to be paid into the treasurer.

The American Coal Products Co. contributed sulphate of ammonia to the agronomy division to the commercial value of $350.00. The Dishbrow Churn Co. donated to the dairy department a combination churn and butter worker valued at $80.00. Mr. C. W. Fowler, of Marietta, donated a Berkshire herd boar to the department of animal husbandry. Hon. B. W. Hunt, of Eatonton, gave some rare plants to the horticultural division, and spray material has also been contributed. The division of agricultural engineering received a five horse power gasoline engine from Sears, Roebuck & Co. Boards and tools have been contributed to the forest museum to the value of $100.00. Almost every concern doing business with the institution has made special prices, thus enabling us to extend and amplify the equipment of every division much more rapidly than would be possible otherwise. We are certainly appreciative of the consideration which our friends have extended us in these matters.

Coöperative Enterprises

An institution carrying on so many varied lines of work naturally finds it necessary to coöperate with an ever-increasing number of agencies in order that the effort of all may be unified, duplication of work prevented, and economy in the use of public funds secured. In accordance with your wishes, our coöperative relationships have, therefore, been maintained and extended during the year. Physical surveys of the following areas have been completed:

Wilkes county 458 square miles; Crisp county 277 square miles; Merriwether county, 520 square miles; Brooks, 463 square miles; Richmond county 472 square miles, or at total of 1990 square miles. Since my last report the chemical surveys of Troupe and Stewart counties have been published, while manuscripts covering the surveys of Dougherty, Jones and Habersham counties have been prepared for the printer. Bulletins on the physical surveys of Jackson, DeKalb, Colquitt, Terrell, Tattnall and Habersham counties have been published by the U. S. Bureau of Soils. A total of twenty-six areas embracing 10,388 square miles have been surveyed since 1912 when our coöperative arrangements with the Bureau of Soils were commenced. Previous to that time the Bureau of Soils had surveyed nineteen areas containing 7725 square miles. Up to the present time 255 types have been mapped in the state and samples from 89 of these types have been analyzed. It is a difficult matter to determine just what new areas should be taken up from time to time. When the work was first commenced there was not much interest in either the physical or chemical surveys, but in the last two or three years the demand for service in this direction has been very great. The plan of filing requests for surveys in the order in which they are received has been followed for some time with considerable satisfaction, and unless advised to the contrary, this will be the method pursued in the future. As the College is only one party to the coöperative enterprize, areas may be selected from time to time other than those rcommended by the institution. This statement is made for the information of the public and in justice to the men charged with supervising the work. The Bureau of Soils had seven men in the state during the past winter. Our appropriation only permits us to maintain one field man and two chemists to do analytical work; hence we are not offsetting satisfactorily the funds expended by the Bureau of Soils, and the work can not be enlarged until provision is made for at least one more field man and additional analysts.

The interest which has been aroused in soil surveys and the fundamental relation they bear to the establishment of a rational type of agricultural practice in Georgia would seem so great as to justify the state in making more liberal appropriations for the maintenance and furtherance of this work. While considerable progress has been made, as the figures indicate, only about one-fourth of the physical survey of the state has been made, while one might say with propriety that the chemical survey has just begun. It will be many, many years before the work can be completed satisfactorily unless the appropriations are enlarged. Ten thousand dollars a year would increase the scope of the work materially and for economic reasons alone would constitute a wise expenditure on the part of the state.

Attention has already been directed to the reorganization which has taken place in the U. S. Department of Agriculture and the creation of the Office of States Relations Service, the intention being to coöordinate all the extension work carried on in the several states through this office. This will naturally be a great advantage to the College as it lessens the number of bureaus and individuals with which the institution has to deal, and insures a definite and unified plan of action so that any new work will be properly connected up with that already in progress.

The field agents in dairying and in beef cattle production maintained in coöperation with the dairy and animal husbandry divisions of the Bureau of Animal Industry have continued their field operations with success. Eighty-eight barns, dairy houses and silos have been built under the supervision of the dairy experts during the year. Demonstrations in raising calves have been conducted on fourteen farms; pasture improvement demonstrations made on ten farms; aid extended to two creameries in starting operations; eleven cream routes surveyed, five of which are in association with the coöperative creamery established at the College; twenty-five contrivances built on cream routes to aid in keeping milk cool; three hundred patrons secured for cream routes; thirty-eight pure-bred animals and twenty-four grades placed on dairy farms; one ice cream plant built; thirty-two separators and one milking machine installed. Records have been kept on 115 cows for a year with the result that 22 of them have been disposed of because of their deficiency in milk production. In addition, 25 churning demonstrations have been made; 65 lectures given; 1050 persons interviewed; and 6400 bulletins and circulars distributed. Through the activities of the dairy agents 20,000 persons were reached involving 30,885 miles of travel.

The beef experts have confined their work to tick-free territory. Most of their work is of necessity of a personal nature, and is done by visitations made from farm to farm. About 5000 cattle were inspected during the year and advice given relative to the feeding and management of the same. Something like 300 head of registered beef cattle have been introduced within the year.

The work of the poultry and pig clubs is also carried on in coöperation with the Division of Animal Husbandry or the Bureau of Animal Industry. The membership in these clubs has been reported on elsewhere. A review of the situation indicates that the enrollment in the pig clubs for 1916 represents an increase of 66.7 per cent over the previous year. The work is carried on in twenty counties, sixteen of which will make their own meat supply this year. Grady county started this work in 1914. Last winter thirty-five carloads of hogs and thirteen carloads of cattle were shipped to Moultrie. All the pig club members were supplied with pure-bred pigs this year. Pierce, the banner sweet potato county of the state, imported ten pure-bred hogs two years ago. This spring fifteen head were shipped out and a carload will be exhibited at Valdosta this fall. The champion pig club member last year was

J. B. Hill, of Bibb county. His pure-bred Berkshire weighed 398 pounds at fair time. His record shows that this hog was raised at a cost of 4.7 cents per pound at a net profit to the owner of $75.51. Georgia pig club members, according to the best statistics available, made a better record last year than did those of Nebraska, producing their hogs at a cost of 2.9 cents per pound of gain as against 4.4 cents in Nebraska. The average net profit per pig was $20.77 for Georgia boys and $7.65 for Nebraska boys.

Poultry clubs were organized in 1915 in nine counties with an enrollment of 600, mainly girls. The work has been favorably received everywhere. Complete reports were sent in by 183 members and 678 birds were shown at the fairs. The club exhibits at the Macon state fair numbered 250 and were in excess of those made by adult exhibitors. The birds displayed were of fine quality and finish. Premiums to the extent of $500.00 were awarded at the several fairs where exhibits were made. There is a growing demand for poultry clubs and organizations have been perfected in 28 counties with an enrollment of 1500 members for 1916. The work is confined to girls at present as this is a line of effort to which they can devote their energies with great advantage.

Hog cholera control work has been continued, the Bureau of Animal Industry having located one representative at the College to carry on educational work among the swine growers of the state. Work under Project A. has been confined to Decatur county, and a swine census shows that the number of hogs has increased from 52,799 in 1913 to 80,000 in 1915. The systematic use of serum in several hundred herds located in that area has thus resulted in reducing the losses from cholera very materially. Under Project C. educational work has been carried forward along the usual lines. One hundred and sixty-four meetings have been held in 148 counties with an attendance of 31,216 farmers; 180 farms visited and 169 farmers interviewed personally; 41 individuals instructed in the use of serum; and 19 public demonstrations conducted at selected points. The travel involved amounted to 28,041 miles.

Arrangements have recently been made for carrying on certain projects with the drainage division of the Office of Public Roads. This work will be started after July 1st, the idea being to promote drainage projects, especially along demonstration lines. This work will not only consist of reclaiming flooded areas, but farmers will be induced to lay drain tiles on both low lands and uplands, and thus illustrate to selected communities throughout the state the necessity of draining land along scientific lines in order to increase and maintain its productivity.

The various lines of work enumerated above are carried forward by funds derived from direct state appropriations made by the General Assembly to the College for general extension work, and to some extent from the Smith-Lever funds as well. The federal bureaus through what are termed indirect congressional appropriations made for the purpose of service work in the states are expending in association with the College the equivalent of $80,000.00 a year. Since it is required that the above funds be duplicated dollar for dollar, this explains the necessity of the state's increasing its appropriation for general extension work from time to time as distinct from the funds appropriated to offset the Smith-Lever fund. It also shows why the College is under the necessity of asking local communities and organizations of various kinds to contribute considerable sums of money to the furtherance of its work. At the present time Georgia is receiving, including the funds available through the office of States Relations Service, $165,174.00 a year. The state has appropriated $65,174.00 to offset this sum, leaving $90,000.00 to be raised from other sources since the initial appropriation of $10,000.00 from the Smith-Lever fund does not have to be offset by the state.

As previously stated, the work of the various club organizations is carried on in coöperation with the public school system and we are under a debt of obligation for the active support and encouragement extended to this work by the State Superintendent of Schools, the state supervisors, county boards of education, county school commissioners and the teachers. But for their helpful assistance the splendid record which Georgia has made in this direction could not have been attained. It is a pleasure to acknowledge the service rendered the institution by these various individuals and agencies.

The test farms established several years ago in coöperation with the Central of Georgia Railway are making progress. Twenty-one of them were operated in Georgia in 1915, containing an average of 36.8 acres per farm or a total of 772.5 acres. The total value of the crop was $28,809.48. The cost of the crop was as follows: Man labor $2831.07; horse labor, $2028.20; fertilizers, $2828.15; harvesting, $2173.81; seed, marketing, etc., $1966.41; or a total of $11827.64. The income from the rent of the land was $2684.25, and the profit was $14,119.56, or a total of $16,803.81. All the money expended for fertilizer, seed, ginning, cultivating, harvesting and marketing was charged against the farms. Twelve cents an hour was allowed for man labor and 7.5 cents for horse labor. Dividing the actual net profit by the acreage, it appears that the net profit per acre was $18.40. This is a fine showing and illustrates the possibilities of Georgia soils where a judicious rotation of crops is followed. The work of these farms is becoming more and more generally appreciated, and the fact that they have been established by several other railroads indicates the favor in which they are held by those who should be in position to judge of their value as a means of introducing and calling to the attention of the farmers the best methods of practice to follow.

As in the past, the chamber of commerce of Atlanta, Macon and Columbus have aided in the maintenance of local and district agents and have contributed liberally to the support of the boys and girls' club work.

The enthusiastic interest with which the extension work has been received is evidenced by the liberality with which funds have been contributed towards its support. Appropriations have been provided through the office of ordinaries and county commissioners, boards of education, boards of trade, fair associations, corporations of various kinds, railways, women's clubs, bankers and individual citizens of every class and walk of life. There has been appropriated for the maintenance of men county agents, $41,000.00, and for women county agents in home economics, $11,400.00. This does not include prizes amounting to $13,500.00 for boys, and to $8100.00 for girls. The value of the premiums and scholarships offered at county, district and state fairs for excellence in the matter of exhibits furnished by members of the various club organizations was $21,600.00. Including the funds contributed for scholarships and prizes, it appears that $74,000.00 has been given for these various purposes, of which $52,400.00 was available for extension work in agriculture and home economics. To this sum should be added the funds available to July 1, 1916, under the Smith-Lever Act amounting to $35,174.00 from federal sources, and $25,174.00 from state sources, or a total of $60,348.00. Indirect congressional appropriations provide $30,000.00, and the Office of States Relations Service for demonstration work, $50,000.00, making a total of $214,348.00 or $57,700.85 in excess of the funds available last year. This does not include the state appropriation of $40,000.00. The total sum available therefore, for the furtherance of the extension work during the fiscal year now closing was $254,348.00. The increases provided for under the Smith-Lever Act after July 1, 1916, and which have already been offset by the action of the Georgia General Assembly will make available in Georgia for the furtherance of the extension work during the fiscal year 1916-1917 approximately $300,000.00. Of this sum at least $200,000.00 will be spent for the maintenance of men and women county agents. This does not provide for the support of the administrative offices and the specialists which are required by the coöperative agreement with the various bureaus of the U. S. Department of Agriculture to be maintained with headquarters at Athens.

The College Farm.

The receipts for the fiscal year are $11002.69. This represents an increase of $829.09 over 1915. The receipts from the dairy herd amounts to $7302.46, which is an increase of $739.86 over the previous year. The profits from the farm are $3832.91 and from the dairy $2933.47. The sale of farm products exclusive of live stock amounts to $1246.26 or an increase of $241.42 over 1915. This is the largest turnover recorded by the College farm and indicates that progress is being made in the right direction, not only in improving the herds and flocks but in so handling and managing the affairs of the farm as to place it year by year on a more satisfactory and efficient financial basis. Faithful service has been performed by those associated with the operation of the farm. The burden of its management imposes a great responsibility which may at times be unduly minimized or lost sight of altogether unless called directly to your attention.

An examination of the farm will show that forty acres of land have been reclaimed and brought under cultivation for the first time. This has entailed a considerable outlay for labor in the matter of fencing, cutting out of brush and stumping the land. The lines of several of the fields have been straightened out and the land put in better condition for cultivation. The terraces have been maintained and improved. Considerable scrub timber has been cut off with the idea of encouraging the growth of Bermuda and other tame grasses. A three-acre tract of woodland has been partly grubbed out and seeded to tame grasses as an experiment to ascertain whether such grasses will grow satisfactorily under Georgia conditions and in semi-shaded areas. Further improvements have been made in the roads, and as soon as a little additional grading and top soiling can be done they will be in excellent condition. It is to be hoped that one or two additional roadways can be cut through the property to give greater access to it in the interest of the farm operations and the hundreds of visitors who come from local and far distant points to inspect our plant during the summer months.

The dairy wing of the main barn is now occupied and a new milk house erected, providing the most sanitary and up-to-date facilities for the handling and storing of milk and cream.

The acreage devoted to crops was as follows: Corn 50 acres; silage 28 acres; oats 65 acres; winter cereals cut for hay 20 acres; cotton 18 acres; cowpeas 30 acres; rye 10 acres; alfalfa 12 acres; planted to tame grasses 3 acres, making a total of 236 acres. Twenty-five acres of rye were turned under for soil improvement, and peas will be planted after oats and rye on 85 acres, and silage after crimson clover on 12 acres, which makes a total of 358 acres cultivated during the year.

Live Stock

There are 144 head of live stock of the farm consisting of twenty horses and mules of which five are thoroughbreds and three high grades; twenty-four pure-bred and six grade Jerseys; twenty-four pure-bred and eleven grade Holsteins; thirteen pure-bred and one grade Shorthorns; fifteen pure-bred and sixteen grade Herefords; six pure-bred Berkshires and eight pure-bred Tamworths. There are now ninety-five pure-bred animals on the farm representing seven distinct breeds, namely one of horses, two of beef cattle, two of dairy cattle, and two of swine. Quite satisfactory herds of the four leading breeds of cattle adapted to Georgia conditions have now been secured, some of the animals possessing exceptional quality. The dairy herd has been said by an investigator who is competent to offer an opinion thereon to be the finest dairy herd he had seen in association with any agricultural college. There has been a steady demand for pure-bred animals and the surplus has been sold down rather closely which accounts for the small number now on hand. A number of pure-bred animals will be bought during the summer or early fall with the funds made available by the trustees for this purpose. Our herd of Shorthorns should be improved and a herd of Duroc-Jersey swine established on the farm. Already, forty-two counties are free of ticks, and many more are being cleaned up and will shortly be released. Thus, an ever-increasing area is becoming rapidly available in Georgia in which all classes of pure-bred cattle can be maintained and handled successfully. On this account the demand for pure-bred live stock is likely to increase for some years to come. Moreover, the College has sold its animals at a reasonable price, quality considered, and since it has been in position to guarantee freedom from disease and proper acclimatization, farmers have felt it an advantage to deal with the College, and by reason of this fact have been saved much loss and annoyance through the importation of animals from other sections of the country which are not always what they are represented to be, and unfortunately seem to be in many cases afflicted with tuberculosis and other ills to which live stock are heir.

A conservative estimate of the value of the live stock on the farm is $17,310.00, an increase of $2770.50 for the year. This shows that the character and quality of the animals have improved as this is one of the largest increases in value recorded in several seasons. The sales of live stock amounted to $3056.02, and included 25 dairy cattle of which 13 were pure-breds, 35 beef cattle of which 1 was pure-bred; 28 hogs of which 27 were pure-breds; and five horses. You are familiar with the excellent pioneering work which the farm has done in the dissemination of live stock in the state. It was through the effort of the College that atention was first centered on Holstein cattle as a promising dairy herd. The College has had much to do with securing the very considerable dissemination of this breed now observed in Georgia. The institution first took up Hereford cattle among the beef breeds, thereby creating general interest in this race of cattle. Later, attention was directed to the Shorthorn because of this breed's well-known ability to give a considerable quantity of milk and make fine beef as well which makes them especially well adapted to the needs of the average farmer. We must of necessity emphasize live stock industries in view of the boll weevil invasion, and you will no doubt be pleased to see the very marked success which has attended the efforts of the College to aid in the introduction and distribution of the most useful breeds of beef and dairy cattle, horses and swine throughout the state.

The Poultry Plant

Yards have been built in front of the new brooder house so that the young chicks from pens of various ages may be kept separate. Plans are being made for the construction of a laying house for 400 additional birds which will enable the department to keep 900 hens next winter. Three hundred and ninety hens were kept last winter and laid in five and a half months 25,368 eggs, an increase of 69.1 per cent over the previous year, a result attributable largely to the more efficient rations used under the new management. The receipts increased for the same period by ninety per cent. There is a greater demand for quality eggs and poultry not only in Athens, but in other primary markets of the state than can be supplied at present. Numerous orders for hatching eggs indicate that poultry husbandry constitutes one of our neglected industries. There is every reason to believe that the College through the agency of its poultry plant and extension division will be able to demonstrate to farmers how to manage and handle birds more successfully in the immediate future.

Trial shipments of eggs were made to New York for the first time. It was found that these eggs topped the market at an average of five to eleven cents per dozen over local prices. These eggs were shipped by parcel post in one dozen sized cartons, thirty dozen to the crate. There is no reason why Georgia producers of fancy eggs should not find a profitable market in northern cities if the local market is unsatisfactory. The matter of marketing frying-sized chickens has also been investigated, and a ready sale has been found for them at forty cents a pound net. During one week in the spring a price of 60 cents a pound was received. The production of frying chickens through the use of incubators and properly constructed brooder houses should easily be made profitable industry in many parts of Georgia. The indifference exhibited towards poultry husbandry on the general farm is due largely to the poor prices received because the average individual does not know how to market his product, and the class of chickens kept is deficient in size and quality. As a result, Georgia eggs weigh five pounds less per thirty dozen than those of other sections. The modern methods of breeding and feeding poultry are not understood by the average farmer, and in many cases foodstuffs are not grown suited to the needs of chickens, while those shipped in from a distance retail at prohibitive prices. The preliminary investigations of the department indicate that there is a great future for poultry husbandry in Georgia if the work is organized and conducted along modern scientific lines, and that there is an opportunity in this direction for hundreds of young men and women living on the farm to make a satisfactory income from an industry which has many attractive features and which does not involve an undue amount of laborious work or call for a large initial outlay of capital.

A considerable number of students are taking advantage of the courses of instruction offered in poultry husbandry and every effort has been made to encourage those who attend the short courses to learn as much as possible about poultry management. There are 1150 birds in the poultry yards at present. Ninety pullets have been trap nested since February 1st and thirty-three pedigreed cockerels of high laying strains have been purchased. Eight egg collecting routes have been established during the spring in connection with the creameries located at Athens, Eatonton and Lafayette, and a price of two cents per dozen above the local price is being paid at present. A bulletin on Poultry Houses for Georgia was printed and distributed and a bulletin on Poultry Clubs for 1915 has also been prepared.

Field Experiments.

This work is naturally associated with that of the division of agronomy. The area of the demonstration field has been increased so that twenty-four acres of land are now devoted to investigation, demonstration and extension work. This great field laboratory is one of the most important and essential of all those sustained by the College. Each year sees a decided increase in the value of the data obtained therefrom. It is safe to say that already information worth thousands of dollars to farmers has been secured as a result of the fertilizer, rotation and plant improvement investigations carried forward. Only suggestions as to the nature and character of the work conducted can be made in the brief space available in a report of this nature.

Under the heading of farm crops it appears that alfalfa will make an average of about five cuttings each season. The average yield for the past five years has been at the rate of 5.51 tons per acre. Some fifty strains of alfalfa have been secured from various parts of the world and grown in nursery rows. The results obtained indicate that the narrow leafed varieties from western South America seem to be more resistant to the hot rainy periods which occur in Georgia at certain seasons than the broad-leafed sorts. The best strain of College No. 1 cotton yielded last season at the rate of 2.5 bales per acre. The investigations of the oil content of cotton seed reported on last year have been continued with results confirming the opinion previously expressed with reference to the variation in the oil content of different varieties and the possibilities of increasing this desirable element through consistent selection. The four acres devoted to cotton in the demonstration field last year brought in a gross return of $444.58. The lint was sold at 12 cents a pound, and the best seed for planting at $2.00 a bushel, and the balance to the oil mill at $44.00 per ton. Observe that there was a gross income from cotton of over $100.00 per acre. This result has been made possible not by high fertilization but by taking an area of land of very moderate fertility and building it up through rotations in which green leguminous crops have been turned under. The average yield of corn from the varieties the past few years has ranged from 30 to 54 bushels. The best yielding sorts are Whatleys with 54 bushels; Hastings with 51 bushels; Marlborough with 50 bushels; Batts with 47 bushels. In south Georgia Rich's Prolific and Scott's Southern Prolific each made 50 bushels.

A thousand strains of cereals are now being grown in the demonstration field. The average of two years' trials indicates that the best date for seeding cereals in this section of the state is October 15th, the average yield for oats being 49.9 bushels, whereas, when seeded on November 15th, the yield fell to 30.5 bushels. The tests conducted at Quitman and Ashburn indicate that November 1st and December 1st constitute about the right dates on which to plant cereal crops in south Georgia. The best strains of wheat developed so far are Fulcaster and Georgia Red with an average yield of 37.5 bushels. Appler oats led with a yield of 73.7 bushels. Fulghum came second with a yield of 65.7 bushels. Turkestan barley yielded 46.6 bushels and Wisconsin Winter, 44 bushels. Selections with south Georgia rye have been continued and a yield of 30.4 bushels obtained. Abruzzi rye under similar conditions made a yield of 23.7 bushels.

The studies in farm management in Brooks county indicate that the cost of growing cotton ranges in that section from 7.5 to 11.6 cents a pound with an average of 9 cents. The results of this survey indicate that cotton is made cheaper on a farm of over 400 acres and at a greater profit than on farms of less than 200 acres. It appears from these investigations that where the yield is not more than one-third of a bale of cotton per acre no profit can be anticipated.

The fertilizer test plats conducted on some 27 acres of three acres each and located in different parts of the state have been continued. Applications of 1000 to 1500 pounds of burnt lime or a ton to a ton and a half of ground limestone augmented the yield of cowpeas by an average of 800 pounds per acre. The use of lime with legumes was most effective in south Georgia. The necessity of studying the fertilizer situation very carefully is shown by the results obtained with cotton on the Conasauga silt loam in Walker county. The increase in line with the different elements was as follows: Phosphorus, 88 pounds; nitrogen 13 pounds; and potash, 2 pounds. The fertilizer cost of the increase per pound of lint was for phosphorus 3 cents, nitrogen 37 cents, and potash $1.00.

The Horticultural Division

The principal development in the horticultural division centered in the completion of a series of hot beds and cold frames. These are constructed of cement and are of a permanent character. The greenhouse occupied first last year has been skillfully managed during the season now closing, and has furnished many valuable lessons to students and has been used for the production of a large number of plants and flowers. Already it is badly overcrowded, and if funds were available, it would be desirable to materially enlarge the structure. This can be done at a moderate cost and would greatly facilitate the work of the horticultural division. The orchards and gardens are in good condition.

Campus

There is a tendency to overlook aesthetic values, and hence as much attention is usually not given to the improvement of the grounds of many of our public institutions as its importance deserves. To teach an appreciation of the beautiful and the utilization of native trees and shrubs for the adornment of grounds around the home and for the general beautification of the farm is both an essential and fundamental matter. A great deal of money is expended each year in an endeavor to secure new, rare and freakish plants, while but little effort is made to impress upon the public the beauty and general adaptability of native trees and shrubs for securing the most desirable landscape effects. They are better adapted than anything else we can secure for use in improving the surroundings of the farm home, school grounds, streets of our towns and cities, and our public highways. It is the proper function of an institution, such as the College of Agriculture, to give attention to landscape gardening and the general adornment of grounds and driveways. To this end some effort has been centered by your direction on work of this character, and though only a humble beginning has been made, the grounds of the College of Agriculture are now quite attractive, and they will continue to improve from year to year as age lends grace and beauty to the trees and shrubs and the formal plantings which have been made.

Arrangements have been made for the establishment of a formal garden on the campus in the area of land extending from the southeast corner of the main building to the veterinary laboratory. Only a small beginning could be made this year by reason of the fact that a considerable amount of grading must be done to put the ground in proper shape, but it is reasonable to suppose that the plantings can be completed another year. It is very desirable that additional permanent walks be laid on the College grounds, but the funds available now barely suffice for their maintenance. It is impossible, therefore, to make many desired improvements until an increased appropriation can be secured. The policing of so large a tract of land as that now in charge of the College of Agriculture should be promptly provided for by the state. It is impossible to prevent some damage to the plantings and the misuse of the grounds by thoughtless persons until such an arrangement can be made. One of the more urgent needs of the campus is a ground house so that implements can be safely stored when not in use.

Roads

About seven miles of roadway have been constructed on the College property. Some of this work was done by the city of Athens in making the fill at the main entrance to the grounds on Lumpkin street. At least six miles have been built through the very satisfactory coöperative agreement made with the Clarke County Commissioners of Roads and Revenues, whereby the state convicts assigned to the University by the Prison Board are cared for by the county and put in half their time on the University property. The cost of constructing the roadways now in use approximates $10,000.00 of which about $9,000.00 should be credited to Clarke County and the balance to the city. During the year two and a half miles of the river drive have been surveyed and one mile built. It follows the banks of the Oconee river as it winds leisurely along. It is well shaded and the harmonious blending of water, tree and sky line make it a thoroughly restful road to travel. It promises to be one of the most valuable assets of the College and a boulevard unsurpassed for natural attraction in the south. When this road is completed it will be nearly six miles long, and when the projected roadways on the farm are finished, we will have at least twelve miles of permanent highway opened up presenting a series of as beautiful vistas as are to be found in any section of the county, and thereby revealing to the public the beauty of the College grounds, as well as providing for the convenient and economical operation of the farm. The necessary surveys have been made and the supervision of the construction work performed by the officers of the division of agricultural engineering. This data is furnished in order that you might be informed of what Clarke county has done and take such action with reference thereto as may seem proper and desirable under the circumstances.

Improvement of the Plant

The primary improvement effected during the year is the completion of the agricultural engineering building. It is 190 feet long and three stories high. It is veneered with buff brick and has a red tile roof, and is altogether an imposing and pleasing structure. It was designed in our division of agricultural engineering and the construction work has been supervised by the men connected with that department. The building has been erected at a remarkably low cost when the character of construction is considered. It contains about 35,000 feet of floor space and will provide ample facilities for some years to come for the division of agricultural engineering. The basement floor will be devoted to heavy machinery and contains the shower baths, toilets, locker rooms and cement laboratory. The second story contains the forge shop, the light machinery laboratory, and instructors' offices. The third story contains the wood shop, the freshman and junior drawing rooms, two large classrooms, toilets and general offices. The division of forestry will be housed in the building for the present. The completion of this building without a special appropriation reflects great credit on the skill with which the trustees have handled the finances of the institution. The building typifies the substantial character of all the work done under the supervision of the Board. It will provide for the adequate instruction of students in what has now come to be regarded as one of the most important phases of agricultural development work. This is essentially an age of mechanics, and farmers and farm laborers must understand how to handle an ever increasingly complicated equipment of machinery. It is not an impropriety to state that this is the finest building of its kind devoted to agricultural engineering problems in the south.

Activities of the Several Divisions

The ideal organization of an agricultural college requires not only provision for instruction, but for research and extension work as well. The divisions of such an institution can not isolate themselves from the public, as might be possible and proper in some other fields of educational activity. By reason of this fact the several divisions must of necessity take up special lines of effort and in a measure deal with the public generally through the correlation of their work with that of the extension division. If the divisions were not aggressive in all of the three lines indicated above, their ability to serve the state would be greatly restricted. There is probably no field of human effort at the present time to which so much general inquiry, thought and consideration are being extended as that of agriculture, and the thousand and one questions which grow out of the soil and the relation of crops and animal life thereto. Every division of an agricultural college, therefore, must be alive and seething with ambition and determined to secure new data for the inspiration and instruction of its student body, for the expansion and development of the department itself, and the increase of the personal knowledge and understanding of the individuals constituting its staff. Certainly the public can not be aided through extension agencies except by men who have familiarized themselves with all existing knowledge concerning their specialties, who have due appreciation of state-wide conditions and a sympathetic interest in the problems of the people as a whole and a desire to serve.

Division of Agronomy

Mention has already been made of the fertilizer test plats maintained by the division of agronomy. Cereal test plats are also maintained at Athens in Clarke county, Ashburn in Turner county, and Quitman in Brooks county. Dr. Carlton, Chief of the Bureau of Cereal Investigations, recently inspected the work at the above named points and commended it very highly. He suggested that provision be made for the employment of an additional man to devote his energies to the study of crop rotations, a most important matter, particularly in view of the boll weevil invasion and the neglect of soil building operations on the average Georgia farm. The division of agronomy has also conducted nineteen demonstrations in seed selection in as many counties. This work is intended to encourage representative farmers to grow seed adapted to the different climatic areas of the state. Attention has been primarily centered on the production of corn, cotton and oats. The necessity of work of this character is illustrated by the fact that a great quantity of the cotton seed now used is infected with anthracnose, causing the plants to die shortly after they get out of the ground. Much of the loss from cotton during the past spring has been improperly charged to the dry weather, when in reality it was due to anthracnose. Surely, it is suicidal to permit the farmers of the state to plant infected seed when it is possible to develop strongly resistant strains.

The differences in yield observed with the varieties of corn tested show that there are many sorts now cultivated which should be discarded, and which would be done if farmers realized the influence good seed exerts on production. A careful study of conditions in Georgia shows that the losses from oat smut amounted to 1,960,888 bushels last year, yet smut may be practically held in check by treating the seed before planting with formaldehyde at a very small cost. In addition to the seed selection work carried on, seed inspections have been made in nine counties so that the division might be in position to certify as to the character of seed offered for sale by certain farmers. The division also supervises the work of the test farms conducted in coöperation with the Central of Georgia Railway.

The officers of this division have written approximately 2700 personal letters during the year and sent out 600 circular letters. They attended 148 meetings and gave 93 days of special service to extension work. This does not include the time of several men who worked entirely in the extension division. Altogether, the representatives of this division traveled 11,857 miles and came in personal contact with 37,823 people during the fiscal year now closing.

Division of Animal Husbandry

The division of animal husbandry conducted a feeding experiment with dairy cows during the winter. A ration of silage and cotton seed meal was fed in opposition to a ration of silage, hay and mixed concentrates, and a ration low in silage and high in hay and mixed concentrates. The cotton seed meal and silage group made almost as much milk with less shrinkage in weight and at a feed cost of 38 per cent less than where a heavy ration of mixed concentrates was used. This data is of importance to every one feeding dairy cows for it indicates that a home-produced ration is after all the most desirable and economical for Georgia conditions. Some interesting experiments on mutations in cattle are also being made. These refer to the peculiar transmission by an in-bred Hereford heifer of an almost uniformly white color. Important data relative to the feeding and management of the dairy herd have been secured. Studies are being made in pasture improvement by the thinning of experimental areas of woodland on the College farm and the seeding of native and tame grasses therein.

Sixty-seven swine demonstrations were successfully terminated in southwest Georgia during the fall of 1915. These demonstrations indicated that the cost of producing a pound of pork varied from 4 up to 38 cents. The class of animals used and the feeding and management accorded them account for the remarkable variation observed. The cheapest pork was made where grazing crops were used, while expensive gains resulted whenever high-priced concentrates were purchased. These figures teach their own lesson and show that the farmer must learn to be self-maintained if he is to raise pork economically and therefore at a profit.

The efforts of the division to overcome the prejudice which existed against silage have been largely successful. Hundreds of silos have been recently erected throughout the state, due primarily to the missionary work done by the animal husbandry division. Experiments conducted on the farm show that a mixture of Red Head sorghum and corn is more satisfactory for silage than corn alone. Fifty farmers were induced last year to try this plan for silage and without exception they report the advantage of using this combination. Recent tests indicate that kaffir corn and sorghum would make even a better combination for silage than sorghum and corn. Arrangements have been made to carry on twenty-five demonstrations with these crops this summer. This division furnished the live stock and took an active part in the operation of the exhibit cars run throughout the state last winter. During the year 4000 personal letters and 1500 circulars have been sent out by representatives of this division. Meetings were held to the number of 292, the days of service amounted to 1105, and the miles traveled to 55,707. The men in this department have been largely instrumental in securing the introduction of 500 breeding animals and have aroused a state-wide interest in the production of live stock calculated to aid in preparing our farmers to meet the boll weevil invasion with the least loss and injury.

Horticultural Division

The horticultural division has continued its studies with the fertilization of tomatoes and hopes by the end of the year to have sufficient data in hand to publish a report that will be of value to truck growers. Fertilizer tests on apples begun in north Georgia several years ago are now beginning to show some interesting results. The differents observed are confined chiefly up to the present time to the rate and character of growth made by trees fed on the different rations. A preliminary study of the peach industry of the state is being carried forward. An effort will be made through the publication of the bulletin to offer peach growers some aid in combatting troubles which have recently appeared in their orchards due to the outbreak of certain fungous diseases which have hitherto not proved damaging to peach trees. This trouble is partly chargeable to the careless fertilization of the orchard, and to allowing the trees to overbear without maintaining the plant food constituents of the soil in proper equilibrium. A study is being made of ornamental trees and shrubs adapted to Clarke county, which of course will have a wide application and should provide suggestions of general interest relative to the improvement and beautification of farm and city homes, and school grounds generally. The division has demonstration experiments in thirty counties of the state and is thus aiding in the campaign for crop diversification by encouraging the growth of more fruits and vegetables. The extension men have aided farmers in selecting and planting about 40,000 peach trees in four counties of southwest Georgia this spring, and actively promoted the shipment of onions in carload lots from Glynn county. Four thousand personal and ten circular letters were written. The men of the division attended 50 meetings involving 250 days of service and 21,533 miles of travel.

Division of Agricultural Engineering

By authority of the Board the title of this department has been changed from that of Farm Mechanics to Agricultural Engineering, making it in accord with the usage now followed in the agricultural and mechanical colleges of the United States. The men associated with this division have supervised the construction of the agricultural engineering building and in addition have prepared and sent out 137 sets of blue prints on requests received chiefly from the county agents. These blue prints cover 49 barns of various types, 37 septic tanks, 4 cottages, 13 hog houses, 10 silos, 23 smoke houses, 10 dipping vats, 1 greenhouse, 5 tool sheds and 3 cattle sheds. Since there are at present no rural architects, the distribution of designs adapted to the needs of the farm is a matter of considerable economic importance. You will no doubt be interested to know that a number of young men are specializing in this subject and we hope in the not distant future to be able to furnish the state with a number of capable rural architects, and thereby modify the type of farm buildings now in general use. On March 23, 1916, an instructor in agricultural engineering was appointed under the Smith-Lever Act. Since April 1st about eighty blue prints have been sent out in addition to nine complete designs made by special request. There are letters now on file seeking assistance along the following lines: drainage and irrigation, dipping vats for hogs and cattle, silos, septic tanks, hay barns and sheds for beef cattle, fair exhibit buildings, cold storage plants, racks for sunning milk vessels, iceless refrigerators, waterworks' plans, feather bed renovating machinery, hog houses, cheap chicken houses, elevator installation, and designs for apple storage warehouse and a dormitory to accommodate 10 students. This will give you some idea of the kinds of assistance desired by the public and our utter unability to meet present demands even though a man has been appointed to give his whole time to this work. The men of the division have written 780 personal and 80 circular letters, have attended eleven meetings equivalent to fifteen days of service and necessitating 2000 miles of travel.

Division of Agricultural Chemistry

This division has charge of the special extension work connected with carrying on the physical surveys conducted in coöperation with the Bureau of Soils and is solely responsible for the chemical survey begun in 1912. The work accomplished by the physical survey has been reported on under the head of "Coöperative Relationships." Of course, the general surveys can be made much more rapidly than the chemical survey, and though the laboratory equipment has been increased as rapidly as finances would permit and arrangements have now been made by your direction for the appointment of a third chemist, it has only been possible to work out the chemistry of the soils in a very few counties. Chemical investigations are of necessity slow and complicated and the rechecking of the results is a laborious and exacting task. In Wilkes county alone fifteen types besides meadow land were mapped, and 56 samples collected for analysis. Sixteen soil types were mapped in Crisp county and 44 samples collected for analysis. Twenty-three soil types were mapped in Merriwether county and 52 samples collected for analysis. The first and third counties lie in the Piedmont section and the second in the coastal plains area. The data for Richmond and Brooks counties are not available yet, but the facts presented will give some idea of the complicated nature of the work of the chemical survey. The reports on the chemical surveys of Stewart and Troup counties have been published and those of Dougherty, Jones and Habersham are now ready for the printer. Five hundred and twenty-nine samples have been analyzed and 460 others are ready for analysis. Naturally, samples have not been taken of a number of counties which have been surveyed. The examination of the different areas and the preparation of the reports even after the chemical work is finished is tedious and exacting. For your information some of the differences in the soil types analyzed are presented. These show astonishing differences and indicate that the agriculture of the state can not be placed on a satisfactory basis until we come to understand and appreciate more fully that at the present time, the wide variation in the essential plant food content in our principal soil types:

	Nitrogen Lbs.	Phos. Acid Lbs.	Potash Lbs.	CaO Lbs.	Acidity
Lowest	392	824	5560	1430	0
Highest	15000	10400	195000	88800	82000
Normal rich soil should contain	6000	6000	60000	Calcium carbonate	Neutral or slightly acid

The chemical division offers the following very important and suggestive statement with reference to the interpretation of the facts brought to light by reason of the survey work in progress:

"An interesting and serious situation develops from the analyses of the soils of the Cecil and Porters series in Habersham county in regard to the relative amounts of phosphoric acid and calcium oxide found. In all these soils the content of calcium is extremely small, and not sufficient by half to combine with the phosphoric acid found. The ratio of phosphoric acid and lime is from 2:1 to 4:1 expressed in terms of the chemical equivalent of their combining proportions. When it is considered that probably most of this calcium is in the inactive, silicate form, the ratio is seen to be really much wider than the figures show.

These facts mean that not over 25 per cent, perhaps, of the phosphoric acid in these soils is in the form of calcium phosphate (the active form of phosphorus in the soil). The remaining phosphoric acid is undoubtedly present as phosphates of iron and aluminum, both of which are extremely unavailable. The relatively high content of phosphoric acid in these soils should be interpreted in the light of these facts. They suggest an interesting line of study and research.

In the same connection it is interesting to note the low content of magnesium oxide present in some of the same soils. Magnesium is uniformly low, and in some cases only mere traces or even none whatever were found. It is more than probable that magnesium is deficient as a plant food in these extreme cases.

One of the most interesting research problems brought out by the chemical work in soils is that of the manner of occurrence of potash in various types of the cecil series. It is the general belief that clay soils contain a higher per cent of potash than the sandy loams, and that the potash content increases in the subsoil. This is usually the case, but analyses of 43 samples of cecil sandy loam, clay loam, and clay from various counties of the state show that in these soils the potash content increases in proportion to the sand content, and that in many cases the per cent of potash is higher in the surface soil than in the subsoil. Some unusual results have also been noticed in the matter of the acidity, or lime requirements, of these soils. The lime requirement has averaged highest in the sandy loam and lowest in the clay, which is contrary to the general rule.

In many of the types in other series analyzed silicic acid or soluble salts, probably of iron or aluminum, have been found which probably influence the lime requirement. This supposition is strengthened by the fact that many soils which do not show an acid reaction with litmus paper show a high lime requirement by the quantitative methods used in the laboratory, showing that the lime requirement is caused by something other than acids in the soil. These salts are thought to be toxic in their influence on plant growth, but to what extent has not been determined."

The division issued a pamphlet during the year on "The Potash Situation" which has been highly commended by those in position to judge of its merit. Attention has also been called to the many worthless substitutes which are being offered for potash, such as so-called potash lye, which is in reality soda lye and does not contain any potash whatsoever. Farmers have also been advised to beware of certain concerns who claim that they have materials containing both lime and phosphoric acid which can be used as substitutes for lime and phosphate rock in correcting soil acidity and supplying phosphorus.

Division of Veterinary Science

The special projects carried forward by this division in coöperation with the Bureau of Animal Industry have been detailed under the head of "Coöperative Relationships." The division is charged under the state law with the manufacture of hog cholera serum to be distributed through the agency of the state veterinarian in Atlanta. The appropriation for this work was cut off by the last session of the Georgia General Assembly, but the law was not repealed. By direction of the executive committee the manufacture of serum has been continued throughout the year. This work was commenced in 1912 when commercial serum was selling at from three to five cents per c.c. The following remarkable reductions have been made in price since my last report: July 1, 1915, from $1.25 to $1.00 per 100 c.c.; December 1, 1915, from $1.00 to 85 cents per 100 c.c. These prices are much lower than serum is being supplied to farmers in other states. In fact, my personal inspection of the plant at the Alabama Polytechnic Institute last March showed that the farmers of that state were paying $1.25 per 100 c.c., although the state had provided $25,000.00 with which to erect and equip a building, and appropriated $3000.00 a year for the manufacture of serum. In South Carolina a similar charge is made, and in Tennessee only the highest grade of serum is permitted to be sold by the state veterinarian, at a cost to the farmers of two cents per c.c. The fact that it has been possible to continue the manufacture of serum without serious financial loss at so low a price in the face of the conditions which must be met is quite a remarkable achievement. Any one who has investigated the situation knows that the price of feed and the cost of hogs are both considerably higher in Georgia and the other southwestern states than in the middle west where serum is largely manufactured. In many instances, serum plants are associated with abattoirs which enables them to greatly reduce the cost of production, and the serum thus becomes in a measure a by-product.

The conditions under which the College plant is expected to operate are extremely unfortunate and impose a serious handicap on the division of veterinary science. In spite of the most persistent effort it has not been possible to secure any information as to the amount of serum the College would be expected to produce or as to the size and character of the containers needed for its distribution. Without funds for additions to our present equipment, it is impossible to enlarge the plant and thereby increase the output of serum and so tend to further lessen the cost. We need to increase the size of our hog house immediately. Our laboratory facilities at present are of the very best, being thoroughly sanitary and up-to-date in every particular. Statements to the contrary are malicious and without foundation, and certainly we have competent officials in charge of the plant. The fact that no definite and properly substantiated complaints have ever been made against it fully justifies this statement. The present arrangement does an injustice to the institution, for if the College is made responsible for the manufacture of serum, it should certainly be permitted to distribute its own product that it might study the results obtained in the field and be in position to change or improve the process of manufacture or method of distribution as to facilitate placing the serum in the hands of the farmers at the lowest cost and with expedition. The state should therefore come to the rescue of the institution or relieve it from the handicap under which the plant is now expected to operate. There has been much agitation relative to the free manufacture and distribution of serum. This does not seem to be a wise policy for abuse of the privilege conferred under such a law would certainly arise. It would be a much better plan to require the farmers to pay a fair price for the serum, and after consultation with the head of the veterinary division, I am of the opinion that we could undertake to manufacture three million c.c. of serum a year at a cost to the farmer of 75 cents per 100 c.c exclusive of carriage charges, and maintain and expand the plant and employ such additional veterinarians and assistants as may be necessary at a cost to the state not to exceed $10,000.00 a year. No fairer proposition could be made in the interest of the farmers of Georgia. There is no problem affecting the welfare of the entire state and that of the institution which should engage your more serious attention and consideration than the adjustment of the present situation with reference to the manufacture and distribution of hog cholera serum.

Provision has been made through your advice for the offering of the first two years of work leading to the degree of doctor of veterinary medicine. Your action in establishing this course and presumably in seeking from the legislature in the not distant future, sufficient funds for its proper expansion and development can not be commended too highly. Georgia now owns well over $100,000,000.00 worth of live stock. There are fifty-four graduate veterinarians in the state. None of these have been educated in Georgia, and no facilities have been provided for instruction of this character. Our live stock industry is now growing by leaps and bounds. Something must be done to enable the farmer who invests his money in high-priced animals to secure men capable of treating them satisfactorily in an emergency. If the legislature will appropriate $10,000.00 annually for maintenance, a course can shortly be developed which will be well enough patronized by Georgia boys to enable the College to turn out competently trained veterinarians in sufficient numbers to meet the existing situation in a satisfactory manner. The men in the department wrote 800 personal letters, attended 16 meetings, spoke to 3395 persons and traveled 1962 miles.

Division of Forestry

The division has made commendable progress during the year. A card index of forest literature is well under way, 1500 cards having been filled out. The willow holt has been extended to one acre. The holt established last year provided 10,000 cuttings, and 2500 more were donated by the Forest Service. About 25,000 seedlings, trees and shrubs were set out, largely by student labor in practica. These will be used for extensive plantings on the grounds next winter, and any surplus available will be sold to residents of the state at cost. Twenty-five hundred seedlings of the nursery stock last year were transplanted on the hillside southeast of the main building. About 800 locust seedlings were planted on a section of land facing the driveway to the horticultural grounds. Twenty-five seed beds have been replanted and now support good stands of pine, fir, gingko, and beech. Some thirty plant introductions were received during the year and most of them are now in a thriving condition. The creosoting plant has been operated successfully, and some 300 posts treated. Several publications have been issued, the most important of which is the Forest Club Annual which was largely paid for through advertising. Arrangements have been made for the holding of the usual forest camp, and plans are now on foot for the establishment of an arborteum on the hillside south of the new agricultural engineering building, thereby transforming this unsightly piece of property in the course of time into one of the most beautiful and useful sections of the College grounds. The forest museum has been considerably enlarged and improved during the year.

Miscellaneous Meetings

The division of agricultural extension organized and conducted 61 field meetings in as many counties during the summer of 1915. These meetings were attended by 12,617 persons and they were held in the territory covered by the county agents. The farmers' institute appropriation having been restored last summer arrangements are being made to organize and hold at least one meeting in each county of the state during the summer of 1916. Field meetings have been found one of the most popular and effective ways of bringing farmers in touch with our demonstration plats and interesting them in the work of the various club organizations. Three speakers are sent to each of these meetings. As this work is carried on in the summer members of our teaching staff are available as lecturers.

The usual educational display was made at the State Fair in Macon and at the Southeastern Fair in Atlanta. Live stock was shown at fairs held at Winder, Commerce and Washington. The College exhibits at the State Fair were housed in a special building and were said by many to be the most complete and attractive educational display ever made in the state. Fully 100,000 people inspected the exhibits sent to the several fairs.

A new form of extension teaching was inaugurated for the first time this winter through the use of motion pictures. The outfit consists of a four cylinder, forty horse power auto truck, a two kilowatt lighting set, a 6A cameragraph, a 12 x 15 miroid flexible screen, and twelve 4 x 11 opaque shades with hangers. Four thousand feet of film were used, illustrating primarily the work of the College and extension division. The first display was made in the open air at Folkston to five hundred people, some of whom traveled twenty miles to see their first moving picture. Through this arrangement effective service work has been done in reaching and placing vital information before thousands of people who had never come in contact with the work of the College. This outfit was on the road from February 15th to May 15, and 64 exhibits were made during that time, two exhibitions often being made in one day. The pictures were generally shown at school houses in the open country. By this arrangement districts off the railroads were reached in an effective manner. The paramount feature of motion picture instruction lies in the fact that the lesson is visible at all times. Addresses were delivered as the pictures were run through the machine and the audience given an opportunity to ask questions and secure any information desired. The program was thus both entertaining and educational. The main difficulty experienced in this campaign was due to the limited size of the halls available in which to display the pictures. Many commendatory letters respecting this campaign have been received, and personally, I feel it is one of the most effective methods yet devised by the College for spreading the gospel of the new agriculture broadcast over the state at a moderate cost.

County Agents

Our agents have a difficult position to fill and are called on to perform every conceivable variety of service at all hours of the day and night. They have to travel long distances in all kinds of weather. They are not paid large salaries when you remember that they are required to provide their own conveyances, and in order to cover the county satisfactorily must of necessity use an automobile, which as you know is an expensive machine to keep in repair and operate. It is an easy matter to criticise and find fault with any agent, and is surely quite unreasonable to expect him to solve every problem that arises in the farmer's experience or to furnish information offhand that the greatest savants in the world have never yet discovered. He is expected to be considerate and cheerful under any and all circumstances, and as you probably know, is often rebuffed where he should anticipate kindness and coöperation. These statements are made that you may more fully appreciate some of the difficulties which the agent has to meet and overcome. In this new and not yet well defined service any agent should be congratulated who makes a fairly good showing, for as with all new undertakings the work is still in its formative stage. That the majority of the agents have succeeded and have rendered acceptable service to the communities in which they reside is self-evident, or the counties would not aid in their maintenance nor insist on the continuance of the work.

As an illustration of what the agents have accomplished in the aggregate probably nothing can be presented to your attention which surpasses in importance the injection of preventative serum into hogs exposed to cholera. Reports on file show that more than 60,000 hogs were treated in over 85 counties. These outbreaks of cholera occurred on thousands of widely separated farms, and but for the accessibility of the agent and his prompt action in aiding the farmer to secure serum and inject it, cholera would have gained much headway in many counties and destroyed millions of dollars worth of hogs. The stamping out of any contagious or infectious disease when it first makes its appearance is now the method advocated by state boards of health and other organizations charged with the enforcement of sanitary laws and regulations; hence, the effective work done by the agents in regard to hog cholera control is worthy of the highest commendation. That their service in this direction has been worth several times the cost of their maintenance is shown by the fact that the number of hogs increased during the year by fifteen per cent, or by 311,300 head. Georgia is credited with making the greatest gain in this direction of any state in the Union, and this increase is in considerable measure attributable to the better control of cholera than in previous years.

Decrease in Hog Cholera in Georgia as Compared with Surrounding States

	1913	1914			
Alabama	110	100	.09	per cent	
Florida	170	150	.12	“	
South Carolina	75	65	.13	“	
North Carolina	58	50	.14	“	
Tennessee	99	110	.11	“	increase
Georgia	165	90	.45	“	
Kentucky	95	90	.05	“	

Note that where the losses per thousand totalled 165 in 1913, this was reduced to 90 in 1914, or a decrease of 45 per cent. The number of hogs recorded above when reaching maturity would have a market value of at least two and a half to three million dollars. Any organization which can aid so materially in the control and eradication of a disease which has caused such serious and continued loss to the farmers of Georgia has performed a service of the greatest economic importance to the people of the state.

The agents have often reported their inability to secure the quantity of serum needed. They have also been abused in a most outrageous and unjustifiable manner for their work in connection with the treatment of hogs with preventive serum. These criticisms have been uttered in the face of the fact that many farmers are from fifty to sixty miles away from a graduate veterinarian, and even if they could secure his services, it would cost probably ten or fifteen dollars. In any instance, he could not reach the infested herd in time to be of any service to the owner. The fifty-four graduate veterinarians in Georgia live mostly in towns and cities, and if the agent can not be taught to diagnose cholera and instruct the farmer relative to the use of serum, its manufacture and distribution by the state will be rendered largely ineffective, and under such circumstances it will never be possible to control and eradicate the disease. Some veterinary practitioners may think that the agent should not undertake work of this character, but the Secretary of Agriculture has ruled that it is perfectly proper for them to do so, and as a matter of fact, the agent would certainly be both inefficient and lacking in intelligence if not capable of performing so simple a type of service work as is involved in the inoculation of hogs with preventative serum. It is not intended that the agent should become a practicing veterinarian or interfere with the prerogatives of that profession, but that he should be in position to serve the farmers in the treatment of their hogs is a self-evident proposition.

Executive Office

The work of this office has grown and developed in proportion to the progress made by the institution as a whole. There are now ten large and well-organized divisions within the institution, employing fifty-three people with residence at Athens. The supervisors and county agents total 131, so that the employees of the College now number 184. Such a large organization operating in a territory of sixty thousand square miles is naturally confronted with a great variety of difficult and perplexing problems which must be promptly considered and adjusted in the interests of harmony and progress. The funds received and disbursed amounted to $199,340.23. The College is concerned in the direct or indirect expenditure of $204,000.00 derived from federal and local sources. This calls for the supervision of a gross expenditure totalling $353,340.23 annually. You will no doubt recall that in addition to securing the offsets to the Smith-Lever fund, it has been necessary to raise $80,000.00 to meet the indirect congressional appropriations which it has been possible to obtain for the promotion of extension and research work within the state. The operation of the Smith-Lever Act on a project basis has made necessary the preparation of a large number of agreements. Fortunately, these were so satisfactorily adjusted that the work has gone forward without friction or delay. There are now seventeen projects in force under the Smith-Lever Act with two more undergoing adjustment.

The growth of the administrative work is such as to more and more restrict my ability to travel about over the state as freely as was possible in former years. Naturally, the work involved in dealing with the large number of individuals who are concerned in some measure with the work of the College or the extension division requires much correspondence of a personal character which I have always endeavored to conduct with dispatch. It has been necessary to make three trips to Washington to confer with the officers of the States Relations Service with reference to the interpretations of the Smith-Lever Act. Happily, our dealings with the Department have been of the most pleasant nature, and I am glad to be able to report to you that Mr. T. W. Reed, our treasurer, was credited by the federal auditor with having his Smith-Lever account in the best condition of any official whose books he examined. No exception was taken to any expenditure chargeable to the initial appropriation available under the Smith-Lever Act.

Addresses were delivered during the year before the joint session of the General Assembly on the Smith-Lever Act; before the Second Pan-American Scientific Congress in Washington, D. C., on "A Decade in Agricultural Education;" before the Georgia Educational Association in Macon on "An Interpretation of the Smith-Lever Act;" before the Georgia Drainage Association in Monroe on "The Importance of Drainage Engineering Instruction in Agricultural Colleges;" before the student body of the Alabama Polytechnic Institute, at Auburn, on "Saving a Billion;" before the Interstate Cotton Seed Crushers' Association, at Memphis, Tenn., on "The Standard Concentrate." Commencement addresses were delivered at Monroe and Bostwick. Addresses were also delivered to the prize winners at the Southeastern Fair in Atlanta, the State Fair in Macon, and before the Atlanta Chamber of Commerce, a teachers' institute in Clarkesville, and before county fairs held in Cartersville, Douglas, Monroe and Millen. A series of lectures was delivered before the short course students on commercial fertilizers, and before the county agents on organization problems.

Student Interests

Every effort has been made to safeguard and advance the interests of the student body. There has been comparatively little sickness and the conduct of the students has been admirable. They have actively coöperated with the authorities in maintaining the grounds and buildings in good condition. I am most appreciative of the assistance they have rendered me and desire to take this opportunity of thanking them for what they have done.

The Agricultural Quarterly has closed another successful year, and has a creditable balance to carry to the credit of Alumni Hall. The standard of the magazine has been fully sustained.

Our students engaged in the usual triangular intercollegiate debates with the agricultural colleges of North Carolina and Alabama. The teams representing this College went respectively to North Carolina and Alabama, while the North Carolina and Alabama teams debated at Athens. Our students won the debate with Alabama but lost to North Carolina. Of the four intercollegiate debates participated in thus far our representatives have won three, which is a very creditable record.

The Georgia chapter of Alpha Zeta has had a successful year, and I believe this fraternity is serving a useful purpose in promoting high standards of scholarship.

The alumni and student body together are centering their efforts on the erection of a club house for agricultural men at a cost of approximately $15,000.00. Last winter an alumni association was formed, and subscriptions to the extent of $2450.00 were secured.

Inventory

The inventory for 1916 has been prepared with as much care as possible, and is presented for your information:

Land, 830 acres	$167500.00
Main Building	135000.00
Power house, including heating plant, light, water, plumbing, sewage, gas, sidewalks, etc.	33250.00
Houses on College property	2000.00
Division of agronomy, including barns, houses and demonstration field equipment	15090.00
Photographic room equipment	340.00
Division of Forestry, including Lumpkin Hall	11109.00
Division of horticulture, including barns, grounds and other equipment	20591.19
Extension equipment and exhibit cases	7030.68
Division of agricultural chemistry, including soil laboratory	6639.91
Library	5740.20
Division of farm mechanics, including laboratory	35810.58

Division of veterinary medicine, including hospital and serum plant	19349.90
Division of poultry husbandry, including buildings	9820.00
Division of Animal Husbandry, including dairy	3192.50
Live stock on farm	17310.00
Farm buildings, barns and tenant houses	24314.31
Tools and implements	2865.40
Total	$516953.67

The total value of the property is approximately $516,953.67 which represents an increase of $34,127.24 over 1915. The usual deductions for depreciation have been made. The value of the building owned by the College is now well over $200,000.00. The value of the land and the main building has been returned as in former years. The price of material and equipment is such now that the main building could not be replaced for the sum indicated above, and if we called on to install the power, heating, lighting, plumbing and gas plants as they now stand, it would cost us at least $50,000.00. The increase in the value of the buildings is chiefly attributed to the completion of the new agricultural engineering hall. The equipment of the division of agronomy is worth $15,090.00; of the division of horticulture, $20,591.19; of the division of agricultural engineering, $35,810.58; of the division of veterinary science, $19,349.90; of the division of poultry husbandry, $9820.00; and of the division of forestry, $11,109.00. The value of the buildings, live stock and implements on the College farm total $44,489.71, an increase of $5222.37 over last year. This statement does not include any credit for the enhancement of the property through the construction of roadways which have cost $10,000.00, and the improvement of the farm for agricultural purposes by a like amount. These figures indicate that the Board has assembled and now has under its direction property worth at least $500,000.00, practically all of which has been accumulated at a remarkably small cost to the state when the character of the buildings erected and the general layout of the property are taken into consideration.

Needs of the College

Requests have been received from every division for the appointment of additional instructors, the enlargement of the class rooms and laboratories and additional funds for equipment. A careful study and review of the situation lead me to believe that they are reasonable and essential if a high standard of work is to be continued. We are housing in our main building and supplying with offices three times as many people as was contemplated when it was originally built. The men pursuing the long courses now overcrowd our class rooms and laboratories. Sectioning has become necessary with the result that some of our professors are carrying twice as many hours as they should. Sapping the vitality of the staff is not economy and is an injustice to the student body. We have many requests for the expansion of the work of the College along various lines which can not be considered by reason of the existing financial situation. I feel quite certain that we could secure the expenditure in Georgia of at least $20,000.00 more of federal funds could we offset dollar for dollar a number of very desirable project agreements offered us.

Courses should be organized immediately in farm management, farm crops, agricultural bacteriology, agricultural botany, agricultural economics, agricultural education, dairying and veterinary medicine. Fellows, tutors or instructors are needed in poultry husbandry, agronomy, animal husbandry, veterinary medicine, agricultural chemistry, horticulture and agricultural engineering. An increasing of $25,000.00 a year in the maintenance fund is necessary to enlarge and support the teaching corps on a satisfactory basis, and meet the demands which the growth in attendance will make necessary in the next three to five years. The General Assembly asked the trustees to establish and organize an agricultural college, and now that you have performed this task so successfully a maintenance fund must be provided in some measure commensurate with the needs of a highly specialized technical teaching institution which is expected to promote research and extension teaching and advise with reference to all welfare projects affecting the interests of 2,650,000 people.

The agricultural engineering building having been completed, the next most urgent need is the erection of a stock judging pavilion in which the department of animal husbandry can be housed and which would provide adequate facilities for instruction in judging and handling live stock, and an assembly room of sufficient size to accommodate special and short course students and farmers' organizations which find it desirable to meet at the College. The short courses for boys and girls have been changed to the summer months mainly to escape the danger of illness from grippe and pneumonia due to the exposure which they are called on to endure by reason of the lack of stock judging pavilion. It will cost $35,000.00 to erect a suitable building and install the necessary sanitary, lighting and heating system. Satisfactory work can not be done in animal husbandry until a special building is provided.

The veterinary laboratory should be completed as soon as possible if a course in veterinary medicine worthy of the name is to be maintained. It will cost about $20,000.00 to do this in a satisfactory manner. The poultry department needs another building and the property occupied by negroes on Green street should be purchased for reasons which are so obvious that they need not be enlarged upon. The construction of a viaduct across Tanyard branch is again respectfully called to your attention. This would greatly facilitate communication between the College and the University. It constitutes one of our most urgent needs. A grounds house should be erected for the department of horticulture, as well as several additional cottages for farm laborers. Additional fencing is needed. and provision should be made for the establishment of a hog ranch.

Whenever the buildings enumerated can be erected, the congestion in Agricultural Hall can be relieved to a desirable degree. The growth in the extension division is such that the quarters they now occupy must of necessity be enlarged. The College needs immediately $55,000.00 for buildings, $10,000.00 for the purchase of the Mack Property, and an increase of $25,000.00 in maintenance. Provision has already been made for the offsetting of the Smith-Lever Act for the federal fiscal year beginning July 1, 1916, and presumably the state will meet the increase due to Georgia for the federal fiscal years 1917-1918 and 1918-1919. The increase for this state on the present basis of rural population is about $20,000.00 a year.

This constitutes a conservative statement of our condition and needs and is not extravagant in any sense of the word. The technical experts employed by the Board of Trustees should be able to interpret the needs of the institution better than those who are unacquainted with the nature and extent of the work which an agricultural college is expected to perform. The suggestion heard at times that the College is asking for larger appropriations than are necessary is utterly without foundation.

The duties and responsibilities you have imposed upon me as an administrative officer require me to present as a matter of honesty and foresight the needs of the institution in a thoroughly straightforward manner and to endeavor in so far as possible through your aid and coöperation to secure from the state the funds needed to take care of the constituency which the College is expected to serve. The very nature of the work which we must perform because of the skill with which it must be prosecuted makes it costly, while the rapid growth in appreciation which has been extended towards agricultural education in recent years necessitates the expansion of the College at a rapid rate in order to meet present and future needs.

Resumé

The work of the year has been presented as briefly as possible for your consideration, and a review of the situation I trust may lead you to conclude that it has been one of creditable progress along every line. I hope you may feel that the staff and all other employees have measured up to the high standard which you originally set for them. I desire to again record my appreciation of the faithful, efficient and energetic manner in which the members of the staff have acquitted themselves, the courteous and orderly demeanor of the student body, and the consideration extended the College by the good people of Georgia who have so uniformly aided and encouraged our work. Little is accomplished in this world by individuals, but where a true spirit of coöperation prevails and all pull together without selfish ends in view, results may be secured impossible under any other condition.

It has been my privilege to be associated another year with the Chancellor of the University and to be encouraged by his generous support and kindly and sage advice. He has been a mentor to me radiating a spirit of cheerful optimism on all occasions. His modesty and self effacement are such that I feel at times that possibly his true worth and service are not appreciated at their face value, and so I venture to emphasize these lovable qualities, and the wonderful influence by reason of their exercise which the Chancellor has exerted on the student body and the staff of the University as a whole, a blessing in which the College of Agriculture has fully participated. Administrative tasks are often most difficult of solution, and only those who have been brought face to face with such conditions can appreciate the comfort and assurance it gives an executive officer to feel that one may always have the advice and support of a man who meets and decides all questions in a spirit of wisdom, justice and moderation.

It has been my painful duty on two previous occasions to record the untimely demise of valued and honored members of this Board, and now I am again called on to report upon the removal by death of one of the noblest and best friends of the institution in the person of the Hon. John T. Newton, of Madison, Ga., who served the College faithfully and efficiently from its first organization, both as a member of the Board and of the executive commitee. By reason of this position he was called on to give much of his time and effort to the work of the College, a service always cheerfully and graciously performed. His kindly disposition, his wide acquaintance, his reputation for honor and integrity, his frankness and fairness overcame opposition and prejudice wherever it developed, and he was instrumental in securing recognition for the College on many occasions where others might have failed. His loss was indeed a severe blow and his kindly counsel will be sorely missed. It was a privilege to be associated with a man of his upright mind and character. I believe that his spirit will ever be present with us and that the shadow of his memory and his faithful service will rest over the institution like a benediction. The Governor appointed the Hon. James E. Hayes, of Montezuma, a member of the Board to fill the unexpired term of Col. Newton.

Nine years ago you commenced the task of building the Georgia State College of Agriculture. No doubt you recall quite vividly the conditions which confronted you at that time. The property which was then placed in your charge had been badly mismanaged and presented a truly forbidding aspect. The improvement effected reflect great credit on your judgment and business ability and are in the main due to the early establishment of a definite constructive line of policy from which you have never departed. Few institutions have been served more acceptably by its Board of Trustees, and the fact that you have ever held the interest of the College above any other consideration accounts primarily for the progress made. The Board has been fortunate in preserving its original personnel in large measure. Hence the College has materially profited by the mature judgment which you have brought to the solution of all its problems.

In conclusion, my own lot has been cast in pleasant places, for you have uniformly supported and encouraged every worthy effort, thereby transferring to me the stimulus of your approval and changing exacting duties into channels of service bordering on the realm of recreation.

Thanking you for the faith you have evidenced in me by placing me in charge of the affairs of the College and trusting that the report presented may meet with your approval, I am,

Very respectfully,
ANDREW M. SOULE,
President.

UNIVERSITY OF ILLINOIS-URBANA
3 0112 111863244